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ABSTRACT

Summarized are proceedings of a 3-day institute for educational researchers and special education teachers which was designed to disseminate knowledge about recent research findings on the development and learning processes of young children, to facilitate the process of translating research findings into educational implications, to disseminate knowledge about the implications of recent research for educating young handicapped children, and to encourage participants to utilize in their own work suggestions developed at the conference. Included are the opening address, as well as brief presentations on the process of relating research and practice and the process of adapting education to the handicapped. Reported are proceedings of seminars on conceptual development, language development, social and emotional development, and perceptual development. Additional references are listed at the end of each seminar summary. (GW)

ED 096795

PROCEEDINGS

of the

SPECIAL STUDY INSTITUTE

THE IMPLICATIONS OF RECENT RESEARCH IN EARLY CHILD DEVELOPMENT FOR SPECIAL EDUCATION

Sponsored by

THE DIVISION FOR HANDICAPPED CHILDREN
NEW YORK STATE EDUCATION DEPARTMENT

In cooperation with

THE SPECIAL EDUCATION DEVELOPMENT CENTER
CITY UNIVERSITY OF NEW YORK AT HUNTER COLLEGE

November 29 through December 1, 1973

Nyack, New York

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EDUCATION & WELFARE
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A Project of The New York State Network of Special Education
Instructional Materials Centers

EC 062 971

PREFACE

The purpose of these proceedings is to stimulate further dialogue between researchers and special educators. This volume is not an end product in identifying "The Implications of Recent Research in Early Child Development for Special Education," but hopefully a beginning of a relationship between researchers and special educators in this translation process. If even a handful of educators of handicapped children pick up an idea for further exploration, the goal of these proceedings will have been accomplished.

The proceedings are a summary of the interactions that took place during the institute. No attempt was made to produce a verbatim account. For those interested in further examination of the ideas presented by the seminar leaders, additional references are listed at the end of each seminar summary.

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SPECIAL STUDY INSTITUTE

"The Implications of Recent Research in Early Child Development for Special Education"

Date-Time: The program begins November 29 at 2:30 p.m. and ends December 1 at 1:00 p.m.

Place: Tappan Zee Inn
Nyack, New York

Program:

Thursday, November 29 - Recent Findings

2:30 P.m.	Registration and coffee	
3:00	Greetings and Introductions	
3:30-5:30	General Session: Dr. Robert B. McCall Fels Research Institute "New Information about Child Development and Learning From Birth Through Age Six" Question and answer period to follow.	
5:30-7:00	Dinner	
7:00-9:00	Area Seminars	
	Conceptual Development	Dr. Marion Blank Rutgers University
	Language Development	Dr. Harry Beilin Graduate Center City University of New York
	Perceptual Development	Dr. Lila Braine Brooklyn College City University of New York
	Social and Emotional Development	Dr. Robert Liebert State University of New York at Stony Brook

Friday, November 30 - From Research to Application

7:30-8:45 a.m.	Breakfast
8:45-10:15	General Session: "The Process of Translating Research into Implications for Practice" Dr. Patrick C. Lee, Associate Professor of Education Program in Early Childhood Education Teachers College, Columbia University
10:15-10:30	Coffee Break
10:30-12:15	Area Seminars
12:15-1:45 p.m.	Lunch
1:45-2:00	Charge to Groups
2:00-4:30	Area Seminars
4:30-5:30	Unscheduled Individual Reports Informal Discussion Materials on Display
5:30-6:30	Dinner
6:30-7:15	General Session: "What's Different About the Handicapped?" Dr. Shirley Cohen, Special Education Development Center, Hunter College and Panel of Special Education Resource Leaders
7:15-9:15	Area Seminars

Saturday, December 1 - Applications for the Handicapped

7:30-8:45 a.m.	Breakfast
8:45-11:00	Area Seminars
11:00-12:00	General Session
12:00-1:00 p.m.	Lunch

INTRODUCTION

Dr. Shirley Cohen*

I am very happy to welcome you to what we hope will be three valuable days of exchange and expansion of ideas. The Special Education Development Center is co-sponsoring this conference with the New York State Education Department, Division for Handicapped Children. We have two speakers who will make some introductory remarks. Dean Milton Gold is the Dean of Programs in Education at Hunter College.

Dean Gold

The purpose of this session is finding out. We are always being accused of doing things on the basis of assumptions, guesses and good feelings without an adequate research base. During these three days together, we hope to find out about recent research in early child development, and how this intersects with early childhood education and special education. This is something which is realtively new and of extreme importance to all people concerned with the education of children, whatever their age, and whatever their ability or disability. We want to move on to how we can apply some of the research. I'm very glad to be here to take part in this conference and to have the privilege of welcoming you here in the name of Hunter College.

*Dr. Cohen is Director of the Special Education Instructional Materials Center, City University of New York at Hunter College, New York, New York.

Dr. Cohen

Dr. Joseph B. Iraci is Program Coordinator, New York State Network of Special Education Instructional Material Centers. He is representing the Division for Handicapped Children, New York State Education Department.

Dr. Iraci

This Special Study Institute, which is one of twelve a year sponsored by the Division for Handicapped Children, was proposed 18 months ago. Recently, the importance of early childhood has been supported by the Fleischman Report, the position paper of the New York State Regents. We think the timing for this institute is great.

The other exciting aspect of this conference is the idea of university people and field researchers, who are working either in clinical or practical situations, coming together with the people who have responsibility for the classroom and for inservice training of teachers. The content, the participants and the timing of this institute are right. I believe that two days from now we will go away feeling that this is one of our most rewarding institutes.

Dr. Cohen

I want to spend a few minutes on the thinking behind this institute. In planning this conference, we had a choice. We could have pursued our primary objectives -- the translation of recent research findings on early child development into implications for educating the handicapped -- by gathering together a panel of some of the best special educators in the country -- and ask them to give you the answers. This would have been the safer route. Our experts would have prepared their answers ahead of time and we would have been assured of a product. We chose not to take this route, but to take the alternate one of asking you to come up with the answers, for several reasons. The first and most obvious reason is that most of you would have sat back and enjoyed an interesting weekend which would have had little or no effect upon you after this weekend. A basic postulate of educational psychology is that learning is more effective and lasts longer when the learner is actively involved in the process. This weekend we intend each one of you to be actively involved in the task of working out implications and applications. We want you, frankly, to struggle with the process so that when you do go back to your jobs it will be with respect and insight into this process.

We chose to take this "everybody works at it" route rather than "the experts give the answers" route for another reason. You are the people who provide the service, who do the practicing. Too often beautiful ideas, plans and programs are developed by us "theoretical special educators" at the colleges which never get used except in a few select research and demonstration centers where there is an abundance of staff, funds and college attached personnel to help in implementation. Sometimes these ideas don't get used because they aren't workable except under such conditions. Sometimes they don't get used because service people don't understand them. We didn't want to come up with another beautiful set of ideas that would be promptly ignored.

The third reason why we didn't turn this job over to a few experts in special education relates to what happens to people when they become seasoned special educators. Many, probably most, special educators become insulated within the world of exceptionalities. Their programming and curriculum ideas reflect a focus on deficits and deviations. This remediational focus, while certainly necessary and valuable, particularly with older handicapped children, is not the only appropriate approach or in some instances the most desirable approach when one is thinking of young handicapped children. It is the underlying premise of this conference that whenever and to whatever extent, young handicapped children can be helped to acquire skills and learnings in a manner similar to that of the normal child, this approach is preferable. If we accept this premise, then we must recognize the importance of an understanding of how young children learn and develop as basic to teaching young handicapped children. Handicapped children often function in many ways like normal children at chronologically earlier levels. To understand their needs, to understand what they need to learn or where they need to be directed next, means knowing where they are in a sequence, what comes before this level of attainment, and what comes after it.

Too often in special education we see children being described in terms of deficits when the behavior in question is not normally present at such an age. When a four year old boy cannot manipulate a scissor well or draw recognizable figures or button his shirt, or sit still long enough to be taught number or letter symbols, he is not exhibiting deficits. When a six year old cannot do these things, he may be. When an eight year old cannot do these things, he is. You may decide anyhow, for reasons special to a particular child and his situation, to train the four year old to use a scissor effectively, but this should not be done in the mistaken belief that this is a critical developmental achievement for a child of this age.

We have chosen as our starting point today to bring you up to date with the latest of what is known about how children usually develop and learn. Jerome Kagan was quoted recently as saying, "In the last decade we have learned more about the first five years of life than had been learned in 300 years before."

I want to turn for a minute to the objectives of this conference. The participants will:

1. Be more knowledgeable about recent research findings re how young children develop and learn.
2. Be more knowledgeable about the process of translating research findings into educational implications.
3. Be more knowledgeable about implications of recent research findings for educating young handicapped children.
4. Pursue further the expansion of their knowledge about recent research findings on early child development.
5. Utilize in their own work the knowledge they acquired in regard to the process of translating research findings into educational implications.
6. Utilize in their own work some of the specific implications and applications developed at the conference.

The first three cognitive objectives parallel the organization that was planned for this institute. First, to focus on research findings. Second, to focus on the process of translating research findings into practice implications. Third, to develop ideas of implications and applications themselves. The last three behavioral objectives reflect our hope that you will not go home and forget all about the three days, and not use them in any way in your professional life afterwards.

OPENING ADDRESS

Dr. Robert B. McCall*

I believe that in the next decade, there will be some fundamental changes in the way psychologists and educators view the general nature of development and particularly the developmental role of genetics and experience. There are vast differences between children, and many of these differences do have some genetic basis. I think that we have underemphasized that possibility. Moreover, I feel we ought to capitalize on such differences rather than try to wash them out of our minds. But, at the same time, I would propose that we have also underemphasized (or at least misemphasized) the credence we give to plasticity and change in human development. We talk glibly of our potential to influence development during the first six years, but not after that. I think that may be wrong. Therefore, I would advocate revaluing our positions on both genetics and plasticity. How is that possible? We will explore that. One implication of this suggests a course of action that is so natural and obvious, that it occurs every day in the home and in school. But, at the very least, I would suggest a greater fervency, excitement, enthusiasm, and creativity in pursuing better education.

*Dr. McCall is Senior Scientist and Chief, Perceptual-Cognitive Development Section, Fels Research Institute, Yellow Springs, Ohio.

What I would like to do in this paper is to try to persuade you that these points have some plausibility and to try to stimulate you into thinking about the implications they may have for your particular educational responsibility.

GENETICS, ENVIRONMENT, AND THE I.Q. MAELSTROM

If we're going to talk about genetics and environment, we might as well start with the latest controversy in that regard, namely, I.Q. To begin, we will discuss the notions of I.Q., the concept of intelligence and the meaning of heritability.

Intelligence: Concept and Measurement

As far as I am concerned, I.Q. is a score on a test which predicts contemporary academic success in the United States to a fairly high degree for majority and minority groups alike - whether we like it or not. The concept of intelligence is something else. It is "intelligence" which is in troupble today, but the I.Q. test is taking the rap for it. You may or may not believe in a unitary, pervasive, inherited, constant entity called intelligence which most people have in varying amounts, but regardless of your view on the concept of intelligence, we can agree that the I.Q. score (whatever it measures) is a useful correlate and predictor of scholastic achievement in the United States for a large segment of the population. In this paper we will be dealing with the I.Q. score, not the concept of intelligence.

Heritability

The concept of heritability is a bit more complicated. Essentially, it is a statistical concept which reflects the proportion of variability in a given trait for a sample of people that is associated with the differences between the genetic make-up of those people. For example, if we gave an I.Q. test to a group of individuals, they all would not score the same value. Differences in scores represent what statisticians call variability, and we can quantify variability with the numerical index that reflects the extent to which each score differs from the others. In its simplest form, heritability is merely the proportion of that variability among scores which is associated with the differences between the genetic differences of the people in that particular group. The remaining variability in score is presumably due to environmental differences between those people.

There are several implications of this notion of heritability. Being a statistical concept and essentially a correlation between differences on the I.Q. test and differences in genetic composition, heritability is an abstract, descriptive, correlation index for a specific sample at a specific time in history. Moreover, and perhaps most importantly, high heritability for a given trait does not necessarily mean that the trait cannot be changed by appropriate environmental intervention. The potential to change "inherited" traits is obvious when it comes to "genetic" diseases, but somehow we forget this principle when we come to personality and mental characteristics.

Let's take a few examples outside psychology and education to illustrate the concept of heritability. Phenylketonuria (PKU) is an "inherited" inability to metabolize phenylalanine to tyrosine which produces a build-up of phenylpyruvic acid in the system, which (by some mechanism as yet unkown) is associated with mental retardation. One gene is apparently responsible for this condition, (though this is a slight oversimplification). Years ago, some level of mental retardation was nearly an inevitable consequence of PKU. Now, a PKU child is kept on a diet low in phenylalanine and can be weaned from that regimen after five or six years of life without mental retardation. Here is essentially a monogenetic trait which can be changed by timely and appropriate environmental interaction. Traits with high heritability can often be changed, and therefore we should avoid using the phrase "genetically determined" because almost nothing is totally determined or fixed by genetics alone.

Notice also that heritability reflects the current contributions of environment and genetic factors - there is no implication that the heritability for a trait will always be the same. For example, years ago heritability for tuberculosis was very high because the TB bacillus was everywhere in the environment. Who contracted the disease was not so much a function of who was exposed to the germ (nearly everyone was), but rather who inherited a biochemical system that was susceptible to it. Since public health measures have now eradicated the tuberculin bacillus from most environments, who develops the disease is currently more a function of who happens to live in the few areas which are still infected with that germ, since most susceptible individuals are never exposed to the bacillus. Thus, the heritability for TB is now nearly zero. TB is caused ("determined") the same way now as it ever was. Only its statistical heritability has changed.

What do these examples tell us about how to interpret statements concerning heritability. When Arthur Jensen states that 70% or 80% I.Q. is inherited (i.e., the heritability of I.Q. is 70-80%), it is not necessary to conclude in despair that we can therefore do nothing about it. Rather, an alternative interpretation is that current environmental circumstances are not having as much effect on I.Q. as we would like, and that we should exert more creativity and more energy, rather than less, in searching for new environmental and educational factors which will have a greater impact.

The traits differ from one another in how easily they may be changed. If you want to change your hair color, all you do is zip down to the local pharmacy and buy yourself a little bottle of something, and presto, changeo. If you want to change your sex, that's a little more difficult - but, it can be done (it helps if you make that decision during the first three months of your prenatal life). Every "genetic" trait depends on a certain environment for its expression, and some of these environmental circumstances are easier for us to manipulate than others. The question becomes: is I.Q. changeable, are changes in I.Q. themselves under genetic influence, what are the circumstances which will change I.Q. and how easily can they be implemented.

Change in I.Q.

Most everyone would agree that I.Q.'s change - there has been evidence for that at least since the 1930's. We at the Fels Research Institute have been asking more probing questions about the nature of change in I.Q. in the last few years. The Fels Longitudinal Study was began in 1929 and today more than 700 children have been administered mental tests, as well as certain kinds of personality, social and physical growth assessments periodically from birth (in some cases before birth) through early adulthood. More than 120 children in this program have one parent who we have followed since birth, and there are many sets of siblings in this study.

With respect to I.Q. tests, children received one of the standardized I.Q. assessments (Stanford Binet, or Wexler Scales) seventeen (17) times between 2 1/2 and 17 years of age. If we simply take a child's highest score and subtract his lowest, we have a crude measure of the amount of change that is possible from one I.Q. testing to another. On the average, children in our study change 28.5 I.Q. points. Since the standard deviation of the test is 16, this is a nontrivial shift in performance. One out of every three children changes 30 points or more, and one out of every seven demonstrates score differences of as much as 40 points or more. We also claim the world's record holder among English speaking children in the person of one child who shifted 74 I.Q. points, which noses out a child in Terrance Moore's study in London by 2 points. Children do change in I.Q. performance and many change quite substantially.

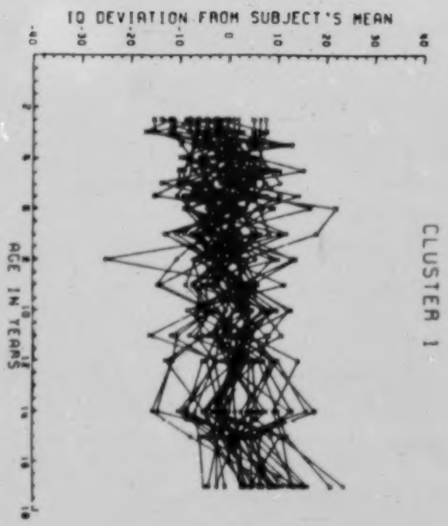
A skeptic might argue that there is error in every measurement and that these fluctuations in I.Q. simply represent random deviations about some I.Q. value which remains constant throughout a child's life. Anyone who has done testing knows that children have "off" days, they vary in their interests and motivations in the material, etc., all of which contributes to changes in score performance. If this were true, then there should be no order or communality in the pattern of I.Q. change children demonstrate over age. Developmental shifts in performance should be random within and across children.

But this is not the case. Most of our children show gradual, consistent, simple, progressive changes in I.Q. Their trends are linear or quadratic curves, not wildly random fluctuations. For example, look at the plots in Figure #1. Approximately 45% of the sample studied in this case is in the top left graph. These children generally don't change a great deal, and if everyone looked like that, one would have to be more friendly to the random error explanation of changes in I.Q. In contrast, the other groups of children manifested definite trends, which in the main were simple linear or quadratic trends (Cluster #2 is the only cubic trend). The children plotted at the bottom right were regarded as "isolates," children who did not fit into one of the other six groups. Notice that there are two groups of children that show large increases in I.Q. performance during the first ten years of life with a turnaround at age 10. There are two other groups which demonstrate sizeable decreases in performand during the preschool period with an inflection point at age 6. It should be generally clear that more than half of our children undergo simple, orderly, and progressive changes in I.Q. performance with development.

The Determinants of Change

Describing the amount and pattern of changes in I.Q. only whets our appetite for an explanation. We will consider several, and I would like to argue that we discard most of these.

Genetic changes. One possibility is that some children have a genetic disposition to change in I.Q. It is possible that the patterns in Figure #1 are simply manifestations of developmental trajectories laid down in a child's genetic composition. Moreover, perhaps there is a genetic influence which makes its appearance at age 6 or 10, producing the major inflections in I.Q. profile which we have observed at these ages.


CLUSTER 1
IQ DEVIATION FROM SUBJECT'S MEAN
-40
-30
-20
-10
0
10
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30
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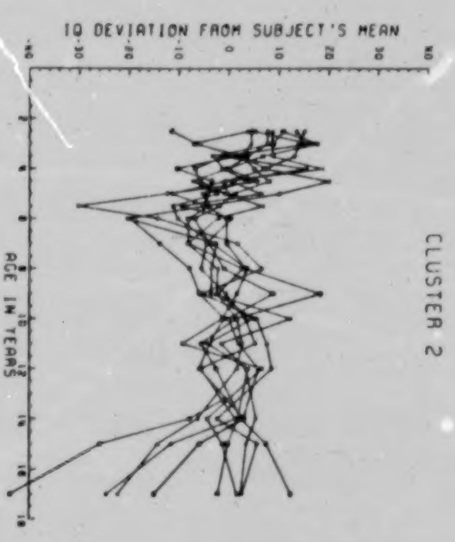
AGE IN YEARS
2
4
6
8
10
12
14
16
18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IQ DEVIATION FROM SUBJECT'S MEAN
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0
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30
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AGE IN YEARS
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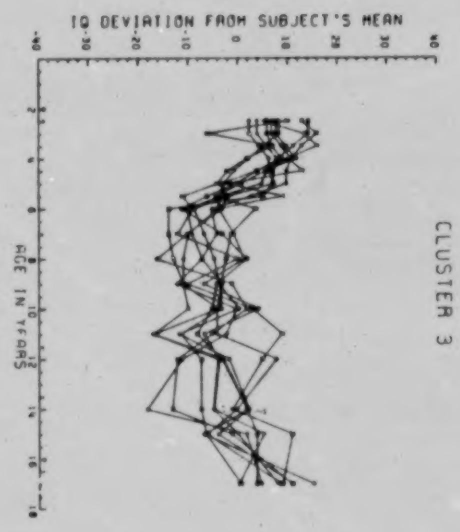
6
8
10
12
14
16
18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IQ DEVIATION FROM SUBJECT'S MEAN
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-10
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10
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30
40
AGE IN YEARS
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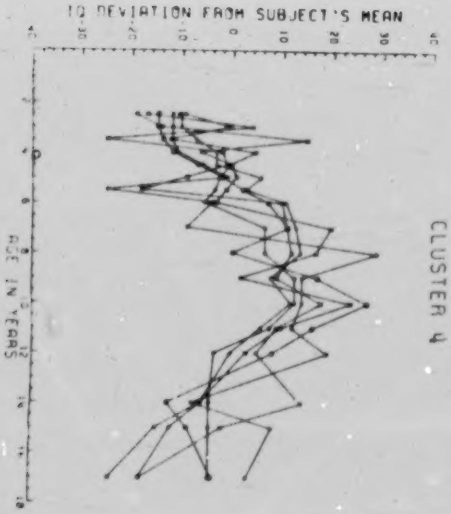
6
8
10
12
14
16
18


CLUSTER 4
IQ DEVIATION FROM SUBJECT'S MEAN
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-30
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0
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40
AGE IN YEARS
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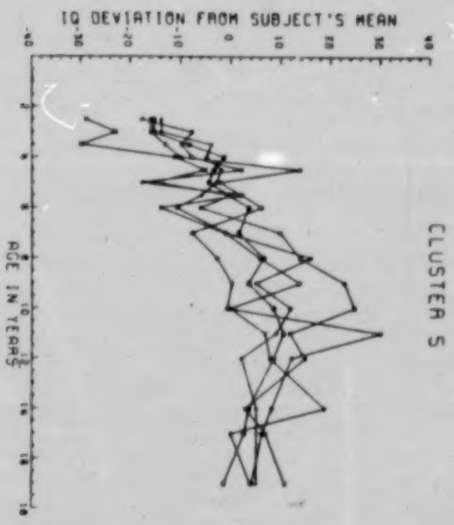
6
8
10
12
14
16
18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10
20
30
40
AGE IN YEARS
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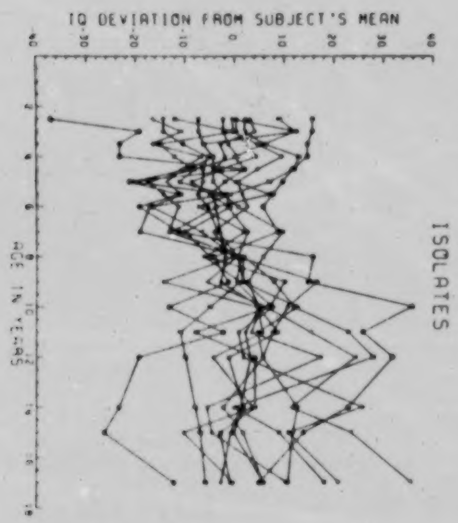
6
8
10
12
14
16
18


ISOLATES
IQ DEVIATION FROM SUBJECT'S MEAN
-40
-30
-20
-10
0
10
20
30
40
AGE IN YEARS
2
4
6
8
10
12
14
16
18

If the genetic argument were true, then siblings should be more similar to one another in their pattern of I.Q. change over age than are unrelated children. We know that siblings correlate in I.Q. about .50 and so do parents and their children. Such correlations simply say that a child who scores in the upper ranges of the scale is likely to have a sibling who scores in the same general vicinity, but these relationships have nothing to say about whether one child who shows a progressive increase in I.Q. over age will have a sibling who also shows an increase. As a matter of fact, we have made such comparisons between siblings on the one hand and unrelated children who are matched for sex, year of birth, and parental socio-economic class. Neither siblings nor parent-child pairs are more similar in their pattern of I.Q. change over age than are matched, corresponding, unrelated individuals. This is true between three and twelve years of age, during the preschool years, during the school years and even during the first two years of life. (There are some reports of greater similarity in infant test score profiles for identical twins than for fraternal twins during the first two years of life, but if mental defectives are eliminated from the sample the genetic similarity also appears to disappear.) Consequently, we do not believe that shifts in I.Q. test performance are simple consequences of genetic programming.

GENERAL INTELLECTUAL CLIMATE OF THE HOME

When environmentalists talk about factors in the environment which influence the I.Q., they most often mention such things as good language models in the home, value for education, attempts to accelerate and "push" ones child, expectancy of academic accomplishment, rewards for intellectual pursuits, opportunity for better education, availability of books, etc. I am referring to these relatively permanent characteristics of the home environment as the "general intellectual climate of the home."

Of course, such factors have some influence on I.Q. performance and perhaps even on I.Q. change. However, I would like to argue that these general environmental attributes may have less influence on I.Q. change than we have supposed. Notice, that siblings should share the same general intellectual environment (home atmosphere). If that pervasive home climate were influencing I.Q. change, then it should have a roughly comparable effect on the developmental pattern of I.Q. in each sibling. But, siblings are not more similar in their pattern of I.Q. change than are unrelated children who do not share the same general intellectual climate. This is true even when the unrelated children are not matched for the socioeconomic class of their parents or when adjustments are made for the fact that a given home variable will have an influence on one child at one age, but his sibling at another age. The presumed effect for general intellectual climate of the home is simply not as strong as we might have suspected.

The idiosyncratic match. We have also examined several other less interesting possible causes for I.Q. change, (e.g., progressive changes in test content, etc.) and we are not persuaded that these other factors contribute much to I.Q. change either. We are apparently left with a puzzle; the amount of change an individual shows during the course of his early years is nearly as much variation in I.Q. as statisticians have estimated to be associated with all possible environmental circumstances, intraindividual as well as interfamilial. Yet, we have no obvious explanation for what is producing these apparently environmental fluctuations in I.Q.

While I must honestly report that we have no particular data favoring one hypothesis over another, I would like to offer one possibility. I suspect that environmental factors operate in a more complicated, idiosyncratic manner than we have previously considered. Perhaps the idiosyncratic matching of a particular environmental event for a particular child at a particular point in his development may influence the course of his mental test performance. That is, rather than simply citing general environmental factors, I propose that it may be necessary to not only point at much more specific environmental events, but to also consider the skills and motivations of a particular child as well as the timing of such experiences before we can predict what influence these events will have on that child's mental performance.

For example, consider a fifth grade child who's reasonably good in mathematics and perhaps science, but never got motivated in school. Suppose he takes a vacation with his parents to Cape Canaveral, and he is really impressed with the rockets. When he returns to school, he suddenly discovers that his fifth grade teacher is a pilot, who then takes him to the airport and up for a flight in his plane. Suddenly, the youngster decides that he wants to be an aeronautical engineer, he blossoms in mathematics and science in school, and improves in mental test performance. Notice that a vacation any other place, a trip to Cape Canaveral when the child was in the third or the seventh grade, or a vacation to the Cape by another child in a different school or with different interests, and the same result might not have occurred. It's the idiosyncratic matching of environmental circumstance with the child's particular interests and skills at that time in his development which must come together to have a predictible effect.

IMPLICATIONS FOR EDUCATION

Changes in I.Q.

Inflection points. Notice in Figure #1 that major reversals in a child's I.Q. trend tended to occur at age 6, 10, and somewhat less frequently at 14. Regardless of what caused these shifts, they apparently occur at ages when we are usually making substantial educational decisions on the basis of just such test information. At the very least, these data compel us to the conclusion that we must test our children frequently during the course of their early years and avoid channelling or pigeon-holing children on the basis of a single testing.

The "formative" years. How often have you heard that the first six years are "formative" for the development of intelligence and personality and some people feel that they have an indelible effect which cannot be erased. Or worse yet, have you heard that 50% of a child's intelligence is developed (or "determined") by the time the child is four or five years of age. Now go back and look at Figure #1. Although the greatest rates of change in I.Q. occurred during the first six years of life, major shifts and especially reversals are almost totally confined to the years after age six. It is simply not the case that mental performance (and I suspect personality as well) is indelibly established during the first six years. Moreover, if the first six years of life were so important, how does one account for Mason's report in 1942 of a girl who spent the first 6 1/2 years locked with her mute mother in a room with the shades pulled. When she was discovered at age 6 1/2, she was unable to speak, incredibly socially withdrawn, diagnosed as mentally defective, etc. With less than two years of therapy, she was described as affectionate, creative, imaginitive, social, and of normal intelligence. What happened to the supposed indelible effect of the first six years?

I do not wish to imply that the first six years of life are not important. Of course they are. Moreover, some skills can be taught more easily during that period of a child's life, and he may even be ready or susceptible to learn those skills best during that period. What I am objecting to is the implication that after you have reached your sixth birthday it is all over and mental and personality characteristics are essentially established. I believe people are much more plastic and adaptable over most of their life span than we have supposed.

The fact remains that there are some consistencies in personality and mental performance over life, though I suggest there are not as many, nor are such consistencies as strong as developmental psychologists have sometimes advertised. The question is whether such developmental stabilities reflect a determined and fixed characteristic of the child, or whether the child has simply had no need to change his behavior because home and school environment have not changed substantially. Is the consistency in mental performance or certain personality characteristics there to be observed only because we parents and educators do not change the environmental circumstances sufficiently during a child's life to provoke adaptive changes in his behavior?

The point I wish to punctuate is that I believe children are changeable throughout their childhood (and probably adult) years, if the environment demands such change. Consequently, there is no need to feel as school teachers that a child's mental characteristics and personality are fixed by the time he gets to school. Therefore, I believe you can have a marked effect on children and at the same time one must be wary not to pigeon-hole pupils early in their educational careers and thereby provide a fixed educational environment from which the child is not likely to escape.

Capitalizing on Differences

Another theme I have hinted at is the uniqueness of individuals. They may be unique because of genetic circumstances or specific environmental experiences or a complex interaction between the two. I feel that despite my emphasis on plasticity in development, we also need to pay more attention to differences between individuals regardless of the genetic-environmental bases.

I would argue that we ought to capitalize rather than wash away such differences. Unfortunately, to emphasize differences between people is Un-American. As a society we abhor differences between people. In educational circles, most people are behaving as if the goal of education is to equalize mental competence across individuals and groups of individuals. We react violently to the possibility of race differences in psychological characteristics and we are greeting the possibility of sex differences with the same social-political revulsion. We have an ethic for egalitarianism that has literally run away with us. The Constitution guarantees equal opportunity, not equality itself. Remember the angry phone calls from parents when educators tried to establish different programs for pupils with different abilities.

Let me be clear. I believe in trying to eliminate poverty and ignorance and in raising minimum standards of living and education for everybody. I believe in closing unnecessary, excessive and arbitrary gaps between individuals or groups of individuals in society. But, I don't give much chance of success to those who believe they are going to close the gap entirely and make everybody equal in mental performance. Moreover, I find that the advertising of the ability of psychologists and educators to achieve egalitarianism has outstripped our ability to do so, and has created false hopes, disappointment, and perhaps despair.

I'm not sure egalitarianism, even if it were achievable, would be desirable. I happen to like the diversity in society. The next time you fly on an airplane, think about whether you would like to have the pilot randomly selected from the population and trained. Think of that the next time you go in for surgery.

An interesting implication of what I have suggested is that our educational practices proffered as equal opportunity programs may represent strategies which can never achieve the egalitarian goal. Although changes have been made recently, we nevertheless essentially offer each child the same education, with the same program, with the same textbooks, with the same teachers, at the same age as for every other pupil. This is the equal opportunity education strategy. But, if my speculations about the importance of idiosyncratic matching educational experiences with the interests and skills of a child at a specific time, then such a one-size-fits-all educational program is more likely to preserve differences between individuals than to ultimately bring them to common levels of performance. I would argue to provide equal opportunities for all children and avoid arbitrary discrimination, but to capitalize on the uniqueness of individuals and to shun unrealistic goals of equating everybody in mental performance. I think we ought to spend at least as much energy looking for ways to live with our diversity, to capitalize on it, to devise a greater variety of educational programs from which children may choose what fits and meshes with their interests and needs, and to promote individual development rather than stifle it.

Sex differences. Consider one type of difference as an extreme example of what I have proposed. The evidence for inborn sex differences in aggressive behavior, mental abilities, and a variety of other behaviors, seems to me to be incontrovertible. The brain is sexed at approximately three months of embryological life. There are brain differences between males and females as well as hormonal contrasts. Boys tend to be more physically aggressive, whereas girls tend to be more verbally aggressive, and there is reasonable neurological-physiological data to suggest a biological underpinning of these differences. This is not to say that society has no effect. Rather, biology does have an effect and we should not push it under the rug in our zeal to promote social change.

While the differences in aggressive behavior are well known, there are also differences between the sexes in mental performance, which are less commonly discussed. Girls tend to be better and more consistent over age in verbal skills, whereas boys demonstrate an edge in spatial-perceptual abilities. These differences have been covered over by the fact that many standardized intelligence tests have deliberately eliminated items which males and females responded to differently. There is an accruing body of evidence which suggests that levels of sex hormones are associated with levels of verbal and spatial-perceptual performance along sex differentiated lines, and there is also evidence of genetic sex linkage for these skills.

The point is that there are real differences in mental performance and behavior between males and females, and that pigeon-holing people into a neuter class by giving males and females the same educational program is only one alternative to dealing with the problem. Another course of action is to take advantage of biological differences in order to enhance the skills of both sexes. Consider an extreme example. For years, reading materials in the elementary schools were much more associated with society's traditional feminine role than with the masculine role. Jack and Jill, or Dick and Jane in the home or at school tend to be more feminine than masculine in their content. Some scholars have suggested that this observation explains why there are more reading problems among boys in the United States than in Japan, for example, where reading is couched in a more masculine context. There is another explanation of why the sex difference in reading problems does not occur in oriental cultures. A study was done in which some poor American children who were having reading problems were tutuored intensively to learn English, but without much success. They were then given the program of elementary reading using Chinese characters rather than our alphabet. With less than six hours of instruction these children learned to read with Chinese characters, but not with the traditional alphabet. One possible explanation which the authors considered was that our language system involves an intermediary auditory translation step between seeing the printed word and arriving at its meaning, whereas Chinese does not. When you learn to read you often (particularly when you use phonetics), look at a word, sound it out from its phonemic structure, even though this auditory step may be silent, and then translate the word into "wagon," for example. There is an auditory translation step between seeing the word and arriving at its meaning. In contrast, Chinese is written in whole word-thought characters, and it does not have a phonemic characteristic or intermediary auditory step. Maybe boys have problems in Western language countries, because they are inferior in the auditory-verbal mode in general, which is required in the acquisition of reading skills in our language system. Of course, this analysis is rank speculation, but it does represent one kind of thinking which could lead to tailoring our educational programs to the unique characteristics of some of our pupils.

A Model for the Educational Process

My message for education is not new. I advocate individualizing education and tailoring it to the skills and interests of its pupils and students. Attempts have been made to do this and a certain amount of progress has been accomplished. I am advocating a more intensive and creative effort in this regard.

I favor this approach not only because I believe there is some suggestion that it may be the most fruitful, but because I believe this is the way development in education occurs naturally in contexts where there is not a deliberate implementation of an educational program. Permit me to describe one such situation.

A newborn baby comes into the world and soon develops an attachment to his caretaker. How does that happen? For many years, psychologists thought the infant became attached to his parent by primary and secondary reinforcement associated with the feeding situation. Or perhaps, there was some Jungian archetypical disposition for baby to love parent. Neither of these notions is probably true. Rather, the infant comes into the world with certain perceptual predispositions of a very general basic sort, and while these dispositions could be satisfied by nonhuman stimuli, human parent tends to be an ideal stimulus object for an infant. For example, an infant in the first weeks of life will tend to look longer at stimuli that are three-dimensional than two, stimuli that have high black/white contrast edges in them, moving stimuli, noises within certain frequency ranges, stimuli which involve a certain amount of uncertainty or unpredictability, and stimuli which respond in some way contingent upon the baby's behavior. Psychologists know these perceptual dispositions by presenting infants with inanimate stimuli which vary in these characteristics and observe what young infants look at the longest. What is fascinating to observe is that the human parent seems to provide all of these optimal stimulus characteristics quite naturally, and thereby represent a stimulus which captivates their baby's attention and the process of social attachment can begin. What do you do with your newborn baby? You hold it close and look at it in a vis-a-vis orientation. Your eyes are high contrast (pupil versus sclera), your hairline represents a high contrast contour, you are three-dimensional, you make noises that are known to be in the audio range which produce quieting and alerting in babies, you talk and smile at your infant contingent upon his smiling and cooing, you move, and you make different facial expressions at different times providing a small amount of unpredictability to keep him interested. A parent is simply an ideal stimulus for a baby. Notice there is a beautiful meshing between you as a stimulus and your baby's perceptual disposition toward what makes him look, listen, and quiet.

While you have to get your infant's attention to begin the attachment process, there has to be some communication between parent and infant as well. One of the first communications occurs when baby cries. It happens that a baby will stop crying if rhythmical sounds are present, if the temperature of his surrounding is brought nearer to an optimum level, if he is tactually stimulated, if he is rocked at a rhythmical rate. Would you believe there have been some developmental psychologists who have determined that rocking an infant up and down approximately 2 3/4 inches, approximately once a second is the ideal "rock" for quieting a baby. All of these facts have been determined without humans, but now consider what you do when your baby cries? You go over, pick him up gently, swaddle him in your arms, look down in his eyes and say "there, there" (a pulsating sound), and rock him about once a second in a 3" arc. Again, there is a fantastic match between the stimuli that will quiet an infant and what parents do naturally. Now, communication in its most rudimentary form is being established.

The second communicating or signalling system between parent and child is the smile. It happens that infants smile early in their life not because they recognize you, but because you are a stimulus which naturally provokes smiling in a baby. Actually, the essential features are your eyes. Infants will smile at black dots, and just to show you that it is not specific to your eyes, they smile more when there are six black dots than when there are two. He doesn't need to see a face, just dots, and he will smile. Such smiling brings contingent response from you, and the communication game is on. Later in his development, he will demand a complete face, and still later the stimulus must indeed be you. The notion is that a baby has a few elementary predispositions and that your natural behavior seems to match them. As a result, you play a social tennis game with each other in which you as a parent do things that work and stop doing things that don't, and your baby does the same. Pretty soon you get it together.

This description of the origins of social communication and attachment represents a model for what I think education ought to pursue more vigorously. That is, attempting to match educational programs and experiences not only with age related abilities, but with individual interests and skills. But individualizing education takes manpower and we simply don't have the money to pay additional people. Fortunately, there are some other possibilities that we are exploring and might pursue further. For example, some school systems are teaching high school students child development and providing a laboratory in the elementary school of the system for these high school students to work as teacher aids. Televised curricula such as the Electric Company is being widely used as the basic reading program in some systems. No single school system could afford to spend that kind of money on curricula. While the Electric Company teaches the same program to everyone, its use frees up time which teachers can use to individualize the televised presentations to their specific pupils. Big Brother programs have shown that high school students can be effective tutors for young children during the Summer. In one program, a twelve-week summer program with poverty teenagers produced as much I.Q. change in the tutored youngsters as the nine-month program employing trained teachers.

CONCLUSIONS

I believe that children differ from one another a great deal, and that some of these differences are biological in origin and some are not. In either case, children of all ages are probably more plastic and changeable than some have previously thought. While the first six years of life may be formative, all is not lost for improving and stimulating children after six years. If the environment changes enough, or in highly relevant fashion, I think it can have considerable impact on children. However, I believe that environmental circumstances do not have their major impact in as simple a fashion as we once supposed. At the very least, we will have to consider not only more specific attributes of the educational environment, but the individual interests and skills of particular children as well as the timing of such environmental events in order to influence mental performance. I believe it is the proper meshing of these factors which can produce the most educational progress.

I admonish you to use this conference to deshackle yourself from some of our traditional ideas, to think thoughts that you might dare not speak too loudly in other contexts and to brainstorm and exchange ideas with your colleagues here. Finally, I hope you will return to your school systems and your jobs a little freer in your thinking, a little richer in your ideas, and perhaps a great deal more excited and enthused about broadening and enriching the lives of your pupils.

DISCUSSION

Question

Do you think there are critical periods or something like imprinting in human development?

Dr. McCall

It is not clear that there are critical periods in which certain behaviors are learned which cannot be learned at another point in development among lower animals. More recent research indicates that imprinting, for example, represents a type of learning which does not differ in any major respect from other kinds of learning. The duck's following response is learned most naturally and perhaps most easily at a certain period in the animal's life when there is a match between his biological predispositions and a stimulus in the environment - just the kind of match that I have been talking about. However, it does not seem to be the case that the duck cannot learn this following response some other time in its development, though by different procedures and under different circumstances.

With respect to humans, if there are "sensitive periods," they are likely to cover much broader developmental periods of time and be even more changeable, reversible, and modifiable by later experience than in animals. Dr. Eric Lenneberg thinks that one must learn a language in the first twelve years of life, otherwise it may not be possible. Even if that is true, twelve years is an incredibly long "sensitive period." Consequently, for humans the strong form of the critical period concept is not likely to be true, nor is the critical period notion very useful. However, it is certainly the case that young children seem to learn shapes and colors with great enthusiasm when they are young, but when this material is taught to them in school at age six and seven they are bored by it. Consequently, it may be easier and more exciting to learn certain tasks at one age than another, whenever the match between individuals and environment is most easily and most efficiently effected.

TRANSLATING RESEARCH INTO PRACTICE

Dr. Shirley Cohen

When we first began to talk about how to accomplish the objectives of this conference, the question was raised as to whether the process of translating findings about children into implications for educational practice was an appropriate task, i.e., could be accomplished or should even be attempted here. The question which followed was, "Who really knows how to do it?" This question bothered me a great deal because I knew it was meant seriously and because it came from a person whose professional judgement I respected. What, therefore, I had started out assuming could be done by the group became something that needed to be worked on; needed to be one of the focuses and objectives of the conference.

The explosion of knowledge about how young children develop and learn during the past decade has left us with a huge accumulation of information only a small proportion of which is being utilized in educational practice. Even when knowledge in a particular area is advancing at a moderate rate, there is usually a gap of several years between theory and research on the one hand, and application on the other. When knowledge increases as rapidly as it has been in the field of early child development, this time lag is likely to be much greater. To a certain extent the translation of research findings into education applications is a haphazard affair. There rarely exists a situation where completed research automatically becomes the subject of scrutiny for educational implications. Some research findings sometimes simply do not attract the attention of educators.

Some cautions may also be in order. Occasionally some research findings for a variety of reasons do attract a lot of attention and catch our fancy and there is a rush at implementing research findings which either do not hold up under later broader testing, or which are not fully understood, with disastrous results. Sometimes the translation process itself goes awry and we get false derivations. Sometimes we take derivations which are perfectly sound for growth-oriented, competent or masterful children and naively, without further examination or modification, apply them to children who (in Abraham Maslow's sense) may be basically deficiency oriented -- too hurt, too threatened to find gratification in exploration itself.

Clearly the thinking behind this institute was that the translation process should not be carried on by special educators alone, but rather should be the work of those who study children and those who help them learn, working together. I think this is a lesson which Jerome Bruner taught and which we are learning albeit very slowly.

THE PROCESS OF RELATING RESEARCH AND PRACTICE

Dr. Patrick C. Lee*

In discussing the relationship between research and practice four assumptions appear to be warranted: First, there is a persistent problem with the research-practice interface. Second, the problem is bidirectional, that is, it does not lie exclusively with practioners, but with researchers as well. Third, the problem is solvable. And finally, the problem is sufficiently important that we should at least begin to look for solutions. Perhaps, one useful way to approach the issue is to conceptualize it as a problem in translation. A simple translation model will be presented. This model is designed to indicate, first, that the translation process is bidrectional and, second, that the translator influences material that goes through him. This second point is quite important because it would be a mistake to view the translator merely as a relay agent. On the contrary, he performs a transformation on educational material such that it corresponds more closely with scientific processes and vice versa.

Figure 1 blocks out several of his roles and functions. Essentially the translator has three roles, an anthropological role, a mediational role and a developmental role, from each of which separate functions derive. Like an anthropologist the translator must master the language, world view, epistemology, folkways, customs, the culture, if you will, of academicians--that is, of those people who are usually found in academic or research and development settings of various kinds. Similarly, he must do the same for practitioners, who also have language of their own, as well as their own customs, epistemology, and folkways. It is imperative that the translator

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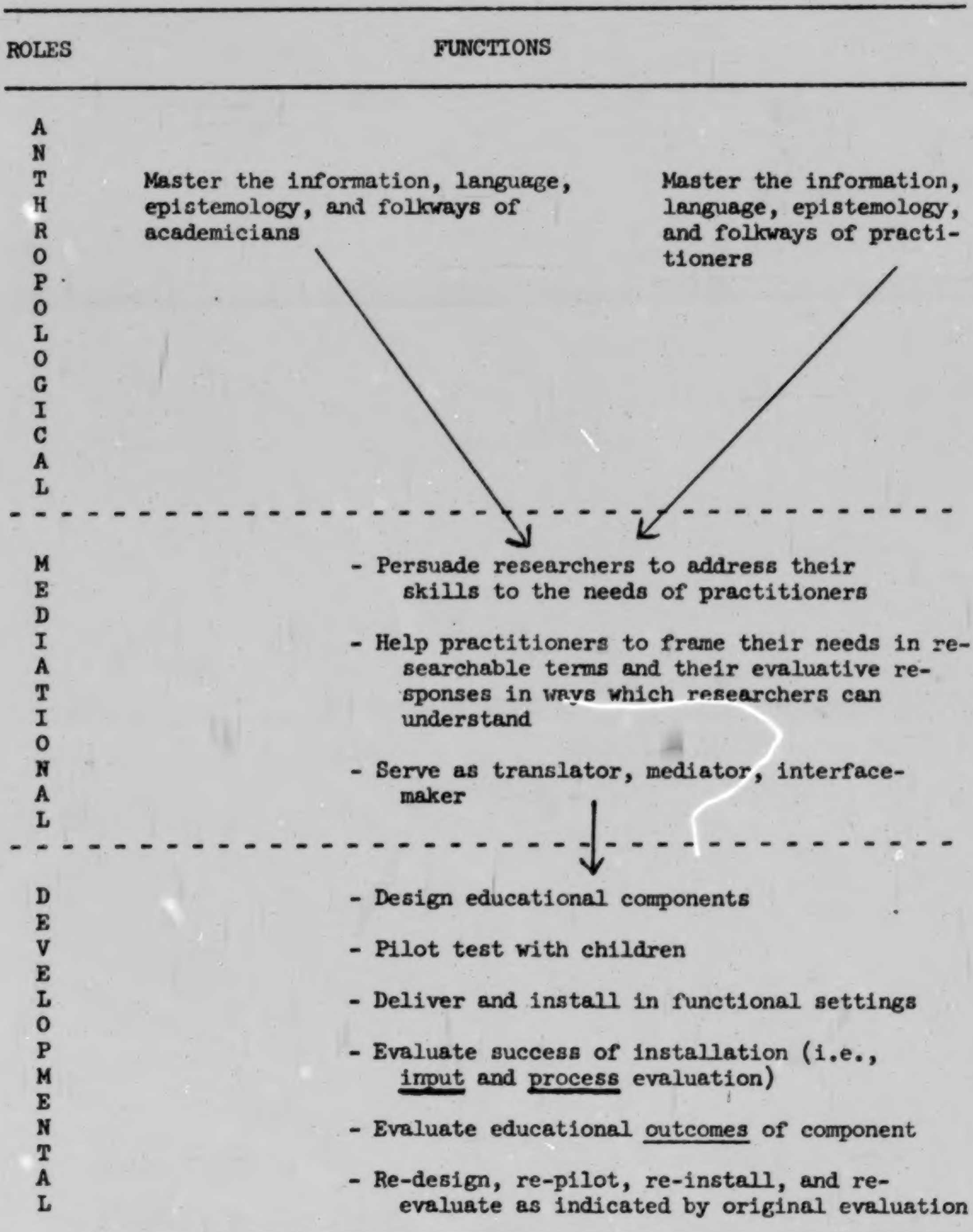

ROLES	FUNCTIONS
ANTHROPOLOGICAL	Master the information, language, epistemology, and folkways of academicians Master the information, language, epistemology, and folkways of practitioners
MEDIATIONAL	- Persuade researchers to address their skills to the needs of practitioners - Help practitioners to frame their needs in researchable terms and their evaluative responses in ways which researchers can understand - Serve as translator, mediator, interface-maker
DEVELOPMENTAL	- Design educational components - Pilot test with children - Deliver and install in functional settings - Evaluate success of installation (i.e., input and process evaluation) - Evaluate educational outcomes of component - Re-design, re-pilot, re-install, and re-evaluate as indicated by original evaluation

FIGURE 1

THE WORK OF THE TRANSLATOR

know what the day to day regularities of educational practice are. Very much like the archetypal anthropologist who visits an island and observes a tribe, the translator must go to the setting in which practioners work to observe their "tribal" customs as a way of determining the realities of their professional life.

Second, the translator has a set of mediational functions. Like a labor mediator, he intercedes between two conflicting groups and tries to seek out their common ground and interests so as to establish a basis for agreement whereby they can work together. Researchers have skills which lead to the production of knowledge or evidence-based products. Practioners, in turn, have a need for sound knowledge and pedagogical instruments to enhance the quality of their practice. However, the exchange does not end here, because researchers also have needs for problems to which they can apply their skills and for clear evaluative feedback on their problem-solving efforts. It is the translator's task to mediate this intricate exchange of problems, skills, and evaluations. Quite simply, he tries to interface the need and skill systems of the researcher with those of the practitioner.

Finally, the translator plays a developmental role. This role involves somewhat more technical functions than the two roles describe above, and focuses on designing educational components and/or systems for the purpose of facilitating the learning of children. More specifically, the developer's job is to design educational components, to pilot test these components with children, to deliver and install these components in practical settings, to evaluate the success of the installation, and to evaluate the educational outcomes of the installed component.

In addition to his separate roles and functions, the translator operates at a number of levels. Research, practice, and translation can be viewed as occuring at the levels of policy, strategy, and tactics. For example, practice can be conceptualized as teaching a lesson (tactics), devising a curriculum (strategy), or establishing guidelines for a state department of education (policy). Presumably practice at each of these levels would benefit from knowledge and techniques appropriate to the tasks of the respective levels. Thus, the translator would draw upon research and theory on systems organization and change, decision making, and policy formulation, if his objective were to inform practice at the policy level. However, if he wished to influence the pedagogical behavior of the classroom teacher, he would be more likely to tap research dealing with reinforcement, learning sequences, use of questions and prompts, and related research areas.

In summary, then, it might be useful to view research as the generation of knowledge, practice as the use of knowledge, and translation as the dual process of moving knowledge from relative uselessness to relative usefulness and of transforming practice from an intuitive to an informed basis. The production, transformation, and consumption of knowledge takes place at a number of levels and in each instance the influence is bidirectional. The agent who takes primary responsibility for keeping the system coherently and effectively operational is the translator.

Areas of Difference and Overlap

Researchers and practitioners have strong and entrenched differences in terms of professional antipathies, epistemologies, and language systems. Further scrutiny of the differences in epistemology and language, however, may begin to yield areas of substantive overlap which may be camouflaged by differences in style. But the professional antipathies between the two camps have tended to overshadow recognition of important congruencies. Researchers have traditionally derogated practitioners as being unsophisticated bureaucracy builders of questionable intellectual prowess. Practitioners, in turn, have developed chronic resentments over the supercilious attitudes of researchers, and have always questioned researchers' relevance to the "real world." The tremendous influx of government monies into the educational enterprise during the 1960's has served to sharpen and renew traditional hostilities because researchers, always in need of support, have followed the funds into the practitioners' bailiwick. Practitioners, with some justification, have tended to view researchers as greedy interlopers who have tried to move into and take over ventures for which they were not trained or qualified.

It is in the context of such recent history that differences in epistemology and language should be examined. First, epistemology . . . the epistemological imperative that motivates the researcher is that knowledge leads to mastery. His primary commitment is to knowledge, not for its own sake, but because it leads to control over the events of nature and/or human society. The practitioner's imperative is that reality demands mastery, a somewhat more reactive and pragmatic position than that of the researcher. Interestingly enough, however, both sides are invested in mastery, and for essentially the same reason: to achieve greater control over reality. But they have different ways of achieving mastery, e.g., experimental design as opposed to techniques of classroom control; different timetables regarding the implementation of mastery, i.e., long term versus immediate; and different postures vis-a-vis mastery, i.e., actively seeking problems to solve versus reactively dealing with problems as they emerge.

The two groups also differ in their characteristic epistemological model, that is, in the ways they come to know and verify their knowledge about reality. The researcher operates in terms of an objective probability model grounded in empirically observed and systematically collected frequencies.

Evidence, i.e., the basic data gathered by research methods, is carefully distinguished from inferences. The latter are not data, but are conceptualizations derived from data. Finally, researchers develop multivariate theories as a result of successive and replicated univariate studies. That is, the findings of many relatively univariate efforts are drawn together, via inferential processes, into relatively multivariate complexes, usually called "theories."

The practitioner, on the other hand, operates out of an intuitive probability model which is tenuously grounded in empirically observed, but unsystematically collected data. This approach to knowing is sometimes referred to as "clinically-based" wisdom and often involves the confounding of evidence with inferences, sometimes to the point where inferences are viewed as self evident. Moreover, practitioners are usually univariate in their classroom functioning. In his fascinating book, Life in Classrooms, Jackson (1968, pp. 115-155) found that even "outstanding" teachers look for a single cause for any given effect, intervene at the level of the perceived cause, and more or less satisfy themselves that the matter has been handled.

In addition to having rather discrepant worldviews, practitioners and researchers use language systems which differ in important respects. The language of the researcher is viewed by practitioners as being overly technical and top heavy with unnecessary jargon. Researchers, meanwhile, view practitioners as given to language which is too unspecific and too unstandardized for the purposes of clear and unambiguous communication. However, both groups seem to like operational language, that is, they describe phenomena in terms of how they operate. For example, a practitioner would probably describe "self reliance" in a five-year-old child as whether or not he could button his clothes, tie his shoes, wash himself, groom himself, and feed himself. Researchers would probably define self reliance in approximately the same way, althought they would want to introduce controls and standardized procedures to insure that the definition, once contrived, remained invariant for the duration of a given study.

As an anthropologist, then, the translator would summarize the world-views and language customs of researchers and practitioners in approximately these terms. As mediator, he would look for commonalities between the two groups. A review of the foregoing indicates that both groups rely on empirically verified data, although they differ in their commitment to systematizing their empirical inclinations. Both groups operate in terms of probabilities, although again researchers are more explicit in their probability statements than practitioners are. Both are concerned with mastery, i.e., with control over the events of their respective life spaces. Both make inferences and, finally, both make extensive use of operational language. These, then, are five elements mutually shared by both professions. These elements, if successfully mediated, could become the basis for constructing a viable interface and mutually beneficial working relationships between the two groups.

The Regularities of the Practice Enterprise

After having examined differences in the way practitioners and researchers know about, think about, and represent the world, a second arena for anthropological investigation involves the day to day regularities of research and practice as separate enterprises. By "regularities" is meant those events, rituals, customs, and constraints which recur so routinely that they represent the invisible infra-structure, the unquestioned parameters, and the unexamined boundaries of life within the two professions

The present paper will focus on practice on the tactical level, particularly the regularities of the school as an institution and of teaching as a profession.

The School as an Institution

There are many approaches to schooling which run the gamut from laissez-faire (e.g., some "free schools") to conventional and/or traditional methods. Despite a great deal of innovation and the proliferation of alternative approaches to education, the modal educational approach continues to take place in group-based, age-graded, traditional classrooms, either in public schools or in parochial schools which, aside from some religious trappings, are essentially indistinguishable from public schools.

It is provocative to consider some of the regularities of schooling as it occurs in this latter, typical setting. First, schools are extremely crowded -- whole neighborhoods of children are stuffed into selected buildings for three to five hours a day (see Jackson, 1968, p.8). Second, schools are involuntary institutions. That is, due to laws requiring universal, compulsory education, the clientele (students) typically have little or no say regarding either the fact of schooling or the selection of a particular school, and the host institutions (schools) are distinctly limited in screening out clients they might otherwise consider undesirable (see Willower, 1965). Third, schools foster sharp role demarcations between the staff (teachers, administrators, etc.) and the students, with spatial, temporal, and idiological regularities designed to support and maintain such separation of roles. Finally, schools are places for detaining children until they reach an acceptible level of maturity. Children are _developmental deviants_ and, in this sense, their status resembles that of other deviants, for example, the legal and/or moral deviants found in prisons and the psychological deviants found in mental hospitals. All three groups share one important element in common: they are not "normal" adults.[1]

Prisons and mental hospitals have been described as "total institutions" by Goffman (1961, pp. 1-124) because they tend to prescribe, and thus constitute, all the life options available to their inmates. Such institutions are crowded, involuntary, characterized by sharp role demarcations, and designed for detaining deviants. It is remarkable how much the school resembles these less savory institutions; moreover, given this resemblance, it should come as no surprise that schools, like prisons and mental hospitals, place a high priority on control of students by staff. Clearly an institution which houses large numbers of densely packed, partially socialized, involuntary youngsters is faced with severe management and logistical problems. It's for these reasons that schools emphasize pupil control first, and education second. The former constitutes the "hidden curriculum," while the latter is the "official curriculum" (see Jackson, 1968, pp. 33-37).

None of this is to say that schools are as cruel as prisons or as bizarre as mental hospitals. Nor is it to say that teachers are of approximately the same psychological makeup as prison guards -- for surely they are not. It is only to invoke a model, in this case the model of the "quasi-total" institution, as a way of comprehending the school's persistent emphasis on, and perceived need for, pupil control. It is extremely important that translators recognize the existence of such regularities because they are, quite literally, the context of schooling. If research findings are to be relevant to educational practice, they must be transformed so as to fit the realities of schooling. Otherwise they will be rejected, as they have been so often in the past.

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[1] While this detention may be less offensive to elementary age children, it creates particular problems for adolescents in secondary schools. Teenagers are caught in a limbo between childhood and adulthood. For a sensitive and intelligent discussion of the status of adolescents and their schools, see Coleman (1965).

One final disclaimer is in order. Schools need not be viewed as inevitably controlling institutions. They simply happen to be very controlling in their current form. If one wanted to change some of the institutional regularities of schooling, then it would be necessary to mount research and development efforts designed specifically to accomplish this goal. Short of such efforts, however, it is absurdly naive to expect schools to embrace prescriptions for practice, however well researched they may be, which ignore the realities of life in schools (see Lee & Gropper, 1974).

Teaching as a Profession

As professionals, teachers assume three general roles, the first having to do with the physical immaturity of children, the second with children's institutional inexperience, and the third with their intellectual inexperience. The teacher's first role is that of custodian. She sees to it that her children are physically secure by anticipating and guarding against accidents, by insuring that they don't get lost, and by maintaining a general vigilence about their physical welfare.

The teacher's second role is to socialize children to the folkways of the school as an institution. The child usually begins schooling without any first hand experience of what it's like to cope in the midst of crowds, to remain for hours in a place where he may not want to be, and to accommodate to a repertoire of routines which often correspond poorly with his egocentric inclinations. The teacher's job is to help the child to accept and deal with these institutional regularities. In other words, one of her primary tasks is to "institutionalize" the child.

The teacher's final role is that of educator. In this role she engages the child's intellectual inexperience and his desire to learn. While there is general agreement that this is the highest form of teaching, it is also understood that children must be rendered physically secure and manageable before they can be educated. Thus, the teacher's primary energies are often expended in the service of preliminary goals, leaving her little imagination or time for cultivating the higher aspirations of her profession, except in the most elite of institutions.

This latter dilemma, however, is resolved by the curriculum. The curriculum is an ingenious instrument which simultaneously constitutes the temporal and substantive dimensions of schooling. Its primary function is to project the content of learning over time. Thus teachers, children, administrators, and para-educational personnel all sequence their institutional lives in terms of the schedule dictated by the curriculum. Imaginative teachers must become duller to suit the curriculum; uninventive teachers are told what to do by the curriculum; bright children are slowed down by the curriculum; dull children are goaded along by the curriculum. By harnessing all to the same timetable and by requiring of all the same interests, the curriculum is a ruthless leveler of indivdual differences. In a very real sense it defines the pulse beat of life in the institution. A first grade teacher receives her children in September and by June they must be ready for second grade. It's as simple as that. Any child who deviates from the formula does so at the risk of being labeled "exceptional," usually in some pejorative sense. The teacher's responsibility is to see that each child does not deviate from the curricular timetable.

Two of her three roles, then, as well as the curriculum, encourage the teacher to place a high premium on pupil control. The behaviors of teachers correspond rather well with the regularities of schooling described in the previous section, which should come as no surprise. The school is the context of the teaching profession. Teachers who cannot accommodate to their professional context are analogous to children who cannot accommodate to the curriculum. They are "exceptional" and are usually weeded out in much the same manner that exceptional children are suspended, excluded, or assigned to special classes (see Task Force, 1970). Moreover, like children, teachers also undergo development. It is interesting to plot the professional development of teachers from training to maturity to see how their stages of professional growth interact with the regularities of schooling.

Inexperienced teachers are primarily concerned with their personal and professional adequacy.[2] Thus they focus on content mastery, establishing classroom control, and promoting themselves as the center of classroom life. Moreover, they do this in essential isolation from any kind of human support. Their early professional accomplishments are lonely,[3] tenuous, and plagued with self doubt. It's no wonder that they place a high premium on classroom control.

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[2] See Lortie (1966), Katz (1972) and Fuller (1969).

[3] For a discussion of the loneliness of teaching, see Sarason (1971, pp. 105-108).

As teachers accumulate experience, Fuller hypothesized that some become less concerned with their own adequacy, but shift their focus to the ways in which children learn. That is, they pass beyond self concern and begin to define their practice as the facilitation of learning. Thus, they gradually grow into their educational role with increasing professional maturity. Most teachers, however, after learning the lessons of their early career, probably never abandon their custodial and socializing roles, even when they have realized themselves as educators.

The Mediational Function

Up to this point the translator's anthropological role has received primary emphasis, with only passing consideration given to his mediational and developmental roles. The reason for this emphasis is that the proper exercise of the latter two roles must be grounded in the findings yielded by his anthropological investigations. The optimal sequence goes approximately as follows. First, the epistemological, representational, institutional, and behavioral regularities of researchers and practitioners are identified, described, and systematized. Second, regularities analogous or common to both groups are extracted from the larger pool of regularities. These become the foundation for negotiating and building a functional interface between the two groups. Finally, having established interface, the translator develops a technology and modus operandi which enables him to draw the two groups into mutually beneficial working relationships.

As mentioned earlier, the final step in this process, i.e., development, is rather technical and it will not be covered in the present paper.

A number of programs have emerged over the last decade at the levels of early childhood and elementary education, most of which were the results of sustained and intense developmental efforts. Examples of such programs are the academically oriented preschool of Bereiter and Englemann (1966) and the DARCEE program (Gray, et. al, 1966), as well as several science and mathematics programs, e.g., the Science Curriculum Improvement Study (Karplus and Thier, 1967). Most of these programs have undergone minor to major modifications since their inception. While such modification is inherent to the developmental process, it is interesting to speculate that there may be an inverse relationship between amount of modification required and amount of anthropological homework done in the first place.

What Teachers Do	What Behavioral Reseachers Know
1. Teachers want to influence behavior, i.e., they are intuitive behaviorists.	1. The laws of much behavior.
2. Teachers concerned with management, control, discipline.	2. How to control, promote, and eliminate behaviors.
3. Teachers make extensive use of positive and negative reinforcement.	3. Kinds of reinforcement, reinforcement schedules, effective contingency management.
4. Teachers use punishment when necessary.	4. The nature of punishment, how to reduce disadvantageous side-effects.
5. Teachers are performance oriented.	5. How to facilitate performance to criterion.

Figure 2 Synopsis of the Behavioral Orientations of Practitioners and Researchers

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Unlike development, however, the mediational function of the translator is considerably less technical and can easily be illustrated in the context of the present paper. On the left side of Figure 2 is listed a number of intentional and behavioral regularities common to most teachers; on the right side are corresponding laws and techniques of behavior developed by behaviorist researchers. The translator's job is to recognize the intersecting nature of the two sets of regularities and pull them together such that the researcher's knowledge informs practice, and the practitioner tests the utility of knowledge.

As described in the previous section, teachers are intuitive behaviorists. They want to influence behavior so as to make children more manageable. For better or worse, they see classroom control as a precondition for real teaching and learning. Behavioral researchers, on the other hand, know the laws and technology of behavior, e.g., how to facilitate desired behavior, how to eliminate undesirable behavior, and how to promote behavior sequences which may not be in a given child's repertoire. In their efforts to control behavior, teachers make extensive use of positive and negative reinforcers, and occasional use of extinction. Researchers are knowledgeable about kinds of reinforcement (physical, social, activity, etc.) and the conditions under which they are most appropriate; about the elements of reinforcement schedules, i.e., timing, spacing, and frequency; and about the importance of effective contingency management. Teachers, even those who have some grasp of behaviorist techniques, often mismanage contingencies -- it is critical that reinforcements be correctly timed, consistently administered, and sufficiently salient to underscore the connection the teacher wants the child to learn.

Although most teachers would prefer not to punish children, they often do not know how to prevent undesirable behavior. So they resort to punishment in lieu of a firm and humane way of dealing with undesirable behavior. Behavioral researchers have examined the parameters of punishment, i.e, intensity, timing, its interpersonal context, and the role of reasoning, as well as some of its disadvantageous side-effects (see Parke, 1969). This knowledge can be used by teachers so as to reduce the specifically punitive and counterproductive aspects of punishment, while retaining its value as a behavior suppressor.

Finally, teachers have a strong performance orientation. There has been considerable research on the behavioral concerns of teachers and one finding which has held up rather well is that teachers are quite task oriented (see Beilin, 1959). The degree of teacher concern with children's performance is indicated by the number and type of questions they ask. Teachers ask between 45 and 150 questions per half hour, while all the children in a given classroom ask an average of less than two questions per half hour. Moreover, 67 to 95 percent of teachers' questions are designed to elicit straight recall of information. These startling figures indicate that teachers are almost obsessed with keeping children on task. Otherwise, why would they check so constantly? (See Sarason, 1971, pp. 72-78 for a review of teachers' questions.) Children are expected to perform against social, moral, and academic criteria and teachers are expected to establish these criteria, communicate them clearly to children, and guide children toward meeting them. Behavioral researchers are well acquainted with the notion of performance to criterion, as well as with means to facilitate or inhibit performance to criterion. In fact, it would not be too strong to say that explicit or implicit performance criteria are at the heart of the research enterprise. It would seem, then, that this performance and/or task orientation would constitute a strong congruency in the sensibilities of the two groups.

This brief survey of the behavioral orientation of most teachers and researchers is an illustration of how the mediation process can work.

This is one of the more obvious congruencies between the two professions and a number of books and guides on the proper application of behavioral techniques have been published for teachers (e.g., Vernon, 1972; Glaser and Sarason, 1972). There are other areas of potential interface, however, which have not yet been mediated and developed, because they are not as obvious as the example outlined above. Such areas as intrinsic motivation, sex-role socialization, labeling and categorizing of children, and moral development are matters of great concern to educators and researchers alike. But the basic work of translation has not yet occurred in these areas, except in the most rudimentary sense. Thus, there is still much to be done. In fact, the surface has barely been scratched.

Concluding Comments

The task of relating research to practice is not a recent concern of educators. Dewey discussed it seventy years ago in his essay "The Relation of Theory to Practice in Education" (1904). Many other commentators have addressed the translation problem in the intervening years with varying degrees of success. For up-dated discussions the reader might want to refer to Carroll (1968), Schwab (1973), and Short (1973).

There are many troublesome aspects to the translation process, but three deserve specific mention. First, the process is bidirectional. There has been a tendency for translators to unilaterally deliver research findings to practitioners, without recognizing that practitioners have much to contribute to the research enterprise as well. For this reason The present paper has focused on the folkways of practitioners, for it is most important that researchers and translators take these into consideration in doing their work. A parallel survey of the folkways of researchers is also needed, so that educators may have a better idea of the constraints under which researchers work.

Second, the interface between research and practice is not simple, isomorphic, and static, but it is complex and shifting. The translation process is made up of a series of intermediate steps such that material from one profession is transformed several times before it is ready for consumption by the other profession. One factor that further complicates the translation process is that neither profession is standing still. Researchers are constantly gathering new evidence, setting new priorities, and charting new lines of inquiry. The practice enterprise is also influx, as evinced by the great current interest in "educational alternatives," e.g., educational television and other related technological advances. We are just beginning to become aware of the impact of Sesame Street on early childhood education. Are we as aware of the overall impact of television on the education of older children? . . . or of television as an educational vehicle in its own right?

Finally, the translation process requires the creation of a new kind of specialist, one who knows everyone's business and develops a business of his own. He must study the customs, institutions, ways of knowing, and languages of both prctitioners and researchers. He must locate the best areas of interface and interpenetration. Then he must master the technology of developing and stabilizing the interface. It is doubtful that anyone can do this as a sideline or on a part-time basis. The problems of translation are too intractable and the results of poor translation are too manifest to leave the process to amateurs or diletantes. Professional translators are needed to bridge the gap between research and practice.

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WHAT'S DIFFERENT ABOUT THE HANDICAPPED?

Dr. Shirley Cohen

What's different about the handicapped? Why are implications for children in general not satisfactory for the handicapped? Why do we have to re-examine the implications and perhaps modify them? There are characteristics which are more commonly found among the handicapped than among the rest of the child population -- characteristics that are reported by teachers and parents, as well as by psychologists, neurologists, psychiatrists and other physicians. While recognizing that there are many patterns of impairment and strengths in handicapped children, we can point to the following characteristics as being quite common.

Many handicapped children have limited interaction and experience with the physical and human environment. This limited interaction is sometimes due to poor mobility; sometimes to sensory impairments; sometimes to rejection by the community including peers; sometimes to overprotection or shame by parents.

Aside from limited experience and interaction in the environment, many handicapped children have a more limited ability to learn incidentally through general exposure. They acquire much less learning than do normal children even when the exposure level is equal. They require more directed instruction.

Handicapped children may also have difficulty imposing or seeing organization in a rich environment. This may be related to problems often reported of handicapped children becoming overstimulated in what we consider good preschool environments.

I think some of the most interesting research is being done today autistic children who appear to have abnormal reactions to stimuli, frequently overreacting, sometimes apparently not reacting at all. Researchers are attempting to relate these symptoms to just that kind of theoretical construct. That is, these children are unable to attach these incoming sensory stimuli to already internalized schemata, and thereby make sense and use of them.

There is another problem that has very specific input into education. The problem appears to be one of meaning rather than of rote acquisition. These children often are not able to make those inductive inferences which we assume they can make. There are steps in the learning process that we skip with normal children, assuming that they will fill them in. This kind of assumption can cause a lot of problems even with normal children. With handicapped children, however, this assumption often leads to disaster. This is one of the reasons why handicapped children have problems with much of the commercially produced materials. I'll give you an example. The Borg-Warner System 80 Reading Program was exhibited last year at the International Conference of the Council for Exceptional Children. My bright six year old daughter sat down to do one of the early beginning reading sets, using a monitor and push button arrangement. She was in kindergarten at the time and was beginning to read. She had a great deal of trouble figuring out that a line with a triangle at the bottom leading from a word on the screen to a place under the screen where there were buttons, meant that if you think this is the right answer, push this button. My daughter would have figured this out eventually, but what unnecessary stress in the meantime. And would a brain damaged or mentally retarded or emotionally disturbed or learning disabled child have been able to figure this out? Would he have been able to tolerate the stress without being turned off? Very often not. I asked if children were taught this process of using the system. The salesman said, "No. They learn it by induction." A handicapped child has so many problems with learning the content itself, he can't deal with this additional process. Often the teacher doesn't recognize that this response process is causing the problem in the first place.

Many handicapped children don't get to the learning task itself. They get pulled away or kept away because they get stuck on what we consider irrelevancies, details, background. Many of these children don't have a concept of what is relevant and what is not relevant. Take a standard Piaget question. Is a doll alive? We're asking a question about animate and inanimate. For some of these children, it becomes a question about death, rather than a question about animate or inanimate. This child never gets to the task. You don't know if the child knows the answer to this question or not, because the child is not dealing with it in the way it's given. The child is not answering what you want the child to answer.

Some handicapped children do not appear to fit into the motivational picture which is receiving the most attention today. They are not exploratory, curious, mastery oriented. They are not intrinsically motivated and do not respond to traditional nursery school type rewards.

Participant

I'd like to mention a consideration related to a sensory loss. If a child is blind or visually handicapped, we often assume that our task is to open up other sensory channels. We also assume that the child is going to learn through alternate channels at roughly the same age that he would have learned through visual stimuli. We often assume that we are going to substitute experiences for the child without realizing that they may not be useful to him at the same age at all. This is a horrible mistake we fall into. I see no substitute for knowing patterns, levels and stages of growth and development.

Participant

I think part of children's experiential limitations are often set up by special education classes or classrooms. We do things to these handicapped children that we wouldn't do to a normal child. Let's take a deaf baby. We sit him on a chair and make him look at pictures. We have made a very constricted environment for this child. We limit the stimuli for him, and create a narrower environment by not giving him an opportunity to walk around to explore things and put things together. Teachers, as well as parents, limit the environment.

Dr. Cohen

Sometimes our techniques have reflected a kind of intimidation with the problems of handicapped children. You take a handicapped child who gets excited in a normally rich nursery schoolroom. When he gets very hyperactive and gets very upset, what do we do? We don't teach him how to deal with it. We take away all the stimuli. Instead of helping him overcome his problems, we are giving into them. We're modifying ourselves in a way that isn't going to be helpful to him later. We do the same thing with some neurologically impaired children who cannot deal with the unexpected. We're very careful with these children. We try not to expose them to the unexpected. In so doing, we don't help them to learn how to deal with the unexpected. In a sense, we're just reinforcing the original problem, rather than devising strategies to help overcome it, or at least deal with it.

Participant

Emotionally disturbed children and some other children do have some hope of getting back to normal. We must remember, however, that severely handicapped children and certainly permanently centrally handicapped children must be looked at as children who have serious problems. They are not ever going to be normal. In the field of the blind, for example, we went through a long period of denying that it was so. We kept saying a blind child happens to be a child who cannot see. We were guilty of telling the parents that if they just treated the child as if he were a normal child, the child would learn immediately in much the same way. What it seems to me we were saying is, "If I have no hopes that you will not become normal, or if I cannot treat you as if you were a normal child, then I reject you."

Participant

We have to recognize that handicapped children are different, particularly those who are handicapped before four years old, or who show up as handicapped relatively early in life. You are dealing with a very complex organism whose systems have, in a sense, been disordered. We really don't know the nature of the disorder, even if the handicap is obvious. The systems develop at very strange rates for these youngsters. You have developmental discrepancies. In terms of helping teachers in terms of intervention techniques, timing is a very critical one. What are we going to tell these teachers when we ourselves know so little? This is a great problem.

Dr. Cohen

I think this is a good point to end our discussion. When you go to your groups, we ask you to think in terms of teaching strategies, or approaches of teachers to children. We also want you to look at content and its organization and the materials through which the content is presented.

CONCEPTUAL DEVELOPMENT

Dr. Marion Blank*

The chapter I gave you, "Concepts by Principles," will serve as the focus for this meeting -- it is concerned with methods for teaching concepts in a natural classroom setting. I'm particularly interested in setting up rules to guide the teacher. The rules may have to be modified in individual situations, but we cannot leave this issue to individual resolution alone, for otherwise an enormous burden is placed on the teacher. He or she has to have some guidelines as to why a particular rule is used or not.

In this session, I want to initially spend some time on the sort of general, philosophical orientation underlying concept teaching. One view is the basic behaviorist, or empiricist view, where you are concerned with a set of techniques and methods adapted from work that really stems from animal psychology. As Stevenson has described, this work has, for the most part, been limited to descriptive statements and models that deal with the application of concepts to relatively simple tasks.

The other view is the Piagetian one which is really the rationalist view, which stresses much more complex concepts, much more intangible, which stresses internal mental structures that are available to the child, or that become available to the child when he masters certain key transition periods.

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The idea in Piaget is that you take the concepts that have proved very productive for the advancement of physical science; for example, space, time, causality, conservation. He takes these concepts and sees their evolution in the child.

For example, he'll say, "What is the concept of space; at what distance will a child recognize certain things," and so on, in a six month old. "What will be a concept in the year old child? Will he reach for the cup before he is actually there, and at what point?" These are the kinds of things he's interested in. And at what point, for example, will he open his hand when he gets to the cup, so that he really has a concept that space has to be covered before the actual reaching is effective. Then he'll look at the space concept of an 18 month old; for example, can a child get an object that you request even when it's not there? Does the child have a concept of space behind himself; at what point does he begin to look back when he has to go down the stairs, and at what point does he no longer have to look back, because he has some internalized concept of what's behind him. At what point can he begin to draw map representations, and so on.

Philosophically, Piaget has been very important because he has set the child up as a constant problem solver. This has been important as a counterweight to the behaviorist point of view, where the child responds much more mechanistically to environmental demands imposed upon him.

The response or behavior is focused upon thereby avoiding the need to introduce mentalistic concepts about what is going on in the child's mind. Piaget, by contrast, represents a mentalistic approach in that he postulates that the child creates complex rule systems by which to interpret his world.

The point I want to make here is that most teachers would philosophically consider themselves Piagetian even if they don't believe in Piaget. They like that approach. They like thinking of the child as a complex problem solving organism. Methodologically, however, they have adopted a behaviorist model in their teaching even though they do not find that model philosophically appealing. Probably 80 to 90 percent of the teaching in America today can be accounted for by behaviorist models and behaviorist concepts. So that you have a paradox in what the teacher thinks of the child, and how she teaches the child. In the vast majority of cases, teachers of the preschool age child are concerned with only five concepts: color, size, shape, form and function. Thus, what they have done is to adopt the most simplistic concepts which have dominated the behaviorist literature.

There is another factor that should be mentioned in relation to concept teaching today. Currently, there is a new emphasis or acknowledgement on the fact that the child comes with already organized concepts about his perceptual-motor world. In other words, the child has the concepts well before you ever get to him. The reason he may seem to lack the concepts is that he doesn't have the labels for telling you about them. This idea contrasts with the view of a couple of decades ago where there was a major emphasis on the essential role of the verbal label in attaining concepts. Statements today, however, stress that the verbal label follows the conception that the child has long since developed. Let's take language acquisition as an example. Roger Brown says that a child around 18 months of age, at the end of the sensory-motor period, has a host of fairly complex relationships -- concepts such as possessive relationships, spatial relationships, attribute relationships, actor-agent relationships and so on. Brown says the possession of these concepts leads the child to ultimately develop the linguistic expression for these concepts (e.g. "book table" meaning "the book is on the table").

Participant

How much of this is related to the translation of the concept into a motoric task? I'm wondering how you check whether the concepts are there. If you're requiring a motoric task as an indication that the concept exists, you're asking the child to do something much more complex. He's going to have to translate it, if he has that concept, into something else.

Dr. Blank

It doesn't have to be that way. We know that the translation from verbal to motor is generally easier than from verbal to verbal. In other words, comprehension -- acting upon a verbal request -- is the earliest form of language acquisition.

Participant

Not necessarily for the handicapped.

Dr. Blank

That's an interesting problem. By a year of age in normal children, verbal to motor translation is present to some degree. If you say "come," they'll come. If you say, "pick up the toy," they'll pick it up. Certainly by 18 months, they have a pretty good system of responding to relatively simple, but still verbal commands. When a child fails to do this, however, you have no ability to say that he doesn't have this skill in his repertoire. In other words, if a skill is not manifested, it may just happen to be the child's choice at the moment not to manifest it. But if it is not manifested, you cannot conclude that the child doesn't have it.

Participant

The child may have the concept, but he's not efficient about applying it at an appropriate moment.

Dr. Blank

That's an important point, but people don't deal with it extensively because it involves a host of variables. Efficiency or ease of mobilizing skills is very important in the teaching setting. The key factor is not whether a child possesses a skill, but whether he can utilize it when the situation so demands. If he can't, he's not much different from the schizophrenic who happens to be caught up by particular concepts at the particular moment, but they are valueless in terms of meaningful adaptation to the demands of the moment. The point for cognition, therefore, is not whether the child possesses a concept, but whether he can apply it appropriately according to the demands of the situation.

Participant

What about preference? Do we teach children what they prefer so that we don't have to buck resistance to a new concept, or do we try to break them from the concept they prefer because they are not learning anything except the concepts they prefer?

Dr. Blank

Personally, I think that if you teach a concept that they prefer as opposed to the mode of operation that they need, they're learning little becasuse they're only rehearsing what they came into the room with. They didn't need you to give them more material to reinforce it. For example, we know that young children tend to prefer color to shape. Teaching color, then, is not teaching, but merely reviewing their preferences.

I don't think, however, that we should set up an absolute rule and say: Don't work with the preference, or do work with the preference.

For example, take the idea of successive versus simultaneous discrimination. In simultaneous discrimination you present two things (for example, a circle and a triangle) and say: "Which is right?" In other words, there's a right and a wrong. Successive discrimination is different. Each stimulus is "correct," but each requires a different response. For example, when the circle appears, the child must pick up a cup on his left in order to get a reward; but when the triangle appears, he must pick up the cup on his right. Successive discrimination is, not unexpectedly, much harder. It makes more demands on memory; two responses must be learned. Now let's go back to the question: Should we teach the child through the easier (preferred) way, or should we select the more difficult (less preferred) way? Most teachers would probably say, let's go from the easiest to the hardest. The fact is, however, the learning retained under successive discrimination is much better than that with the simultaneous discrimination. In other words, in the short run, the easier task may seem preferable; but in the long run, the more difficult task may have greater merit. We have got to begin to assess behavior on much broader grounds than we have been accustomed to doing.

In addition, there are certain learning situations where we must use the more complex paradigms. Learning of letters, for example, must at some point go beyond simultaneous discrimination and involve successive discrimination if you want the child to learn the sounds associated with each letter. You can't say that a "D" is right and an "A" is wrong. If this is a "D" you've got to learn that it represents a particular sound. You cannot eliminate successive discrimination, even though it's harder, because there are real demands in the school situation where the child is simply going to have to master it. The question in many cases therefore is, how do you help the child master the harder discrimination; it is not, how do you eliminate harder tasks for the child.

Participant

Do you have rules that we could use for teaching concepts to children?

Dr. Blank

I have tried (in the paper you received before the meeting) to present a set of systematic rules by which we could teach the traditional concepts of the preschool period -- the period from three to six years of age. We have almost all the information we need, but it has never been intergrated to form a comprehensive system for teaching concepts. What we must do is to establish this integration. For example, we know the superordinate reasoning is beyond the young child, yet we teach on basis of superordinates (planes, trains and cars are vehicles). We say the young child learns through sensory-motor learning, particularly the motor aspect, and yet we've rarely utilized motor actions in the teaching of concepts.

Let's start with the sequence by which a concept may be taught. There are a set of principles involved. For example, we know that young children cannot take in much verbal information, and the more handicapped they are, the less likely they are to take in verbal information. In spite of this, in most cases that I have seen, the teacher tends to simplify verbal information that is confusing the child by introducing more abstract verbal information. We as adults are so verbal that in our efforts to help the child we automatically try to bring in other verbal associations.

In the system I have outlined we only teach a concept when the child doesn't know it. We don't teach a predetermined set of concepts in any lesson because it would be foolish to do so. But if a child fails at a concept, you know he needs help. The quality of the error, or wrong response, tells you whether you should teach the concept or not. In other words, if you get a response that is totally unrelated to the question, most likely that concept is beyond the child and should not be taught. Here's a simple example. If you say to the child, "Why should we make boots of rubber instead of paper?" And the child says, "My mommie put boots on today." This answer shows no real attempt to address the problem. You know that the question is way out of the ballpark.

On the other hand, if you get an incorrect answer, but it shows that the question has been understood as a problem, the child could profit from teaching at this point. We have developed a gradation of incorrect responses. Analysis of the quality of the incorrect response tells you whether you can or should teach the concept or not.

The first step in teaching, then, is the error. Let's take a concept such as corner. The first thing I might say to the child is, "Go to the corner and get me the book," or something of this sort. If he looks bewildered, I might ask, "Do you know what a corner is?" Should he shake his head, I would initiate the concept teaching sequence. The first step is to give very simple illustrations --clear examples of the category to be taught. Generally, it consists of a simple command which focuses the child's attention on the item under discussion. The request can be one of imitation of what the teacher has just done (e.g., a request such as "This is a corner. Come over and touch the corner that I just touched."). The theme is to have the child act on every bit of verbal information as it comes in.

The second step is a clear definition of the function or attribute of the instance. This is critical for it takes all of the problem solving away from the child. In effect, what you are saying to the child is, "I'm going to help you. I'm going to show you exactly what I mean when I use the word. For example, a motor-functional definition of corner would be based on the simple idea of "turn." We go, go, go (along the wall) until we can't go anymore. The place where we have to turn is the corner.

Participant

What if the child says, "I can turn here," and the here isn't the corner?

Dr. Blank

If the child can challenge you, you don't have to worry. It means he's got the concept because one can only challenge when one is fairly confident of an idea. In addition you can answer, "Yes, you can turn here, but you don't have to. But at the corner you have to. You can play into his game. That isn't the problem. The problem is when the child keeps saying, "I don't know what you mean." It is here that a simple motor mediator such as "have to turn" is so helpful to lead the child to isolate the key property of "corner."

A child learns his concepts through motor actions. He learns that a cup is a cup because when it is turned over the contents fall out, because when he lifts it to his mouth, he can drink, when he drops it, it breaks, and so on. Concepts that have no reasonable motoric mediators, such as color, shouldn't be taught. It's non-productive. Once the child achieves the idea of extracting features, he'll get color. Left-right is another difficult concept to teach because there is nothing in the real world whose identity depends on a left-right orientation. Up-down, on the other hand, is not too difficult for children to learn because the identity of almost any object is vitally affected according to whether it is right side up or upside down.

But the child doesn't learn by motor action alone. When the actions are used without any accompanying verbal explanation, they become nonsensical movements. For example, if the child were to be taught the concept of "second" without any verbal explanation, he might be shown to hold back from picking every first thing in a sequence. This type of unexplained delay would result in confusion and frustration, and not the awareness of the concept of "second."

Participant

Then why was my suggestion of illustrating hard versus soft wrong when I knocked like this? (TAPS) How do you illustrate hard? And I said like that, and why wouldn't he do it on soft and have a kinesthetic response that you would focus on?

Dr. Blank

Let's pretend that this is cotton and I go like this, and this is wood and I go like this. (TAPS ON TWO DIFFERENT OBJECTS.) Here you're relying on the child recognizing that the same action (pressing or tapping) leads to different results. You're leaving him to figure it out and you're not focusing him on the difference.

Participant

But if I told him and pointed out to him that. It's the same way.

Dr. Blank

What would you point out?

Participant

You would get a sound. You would get a hurt. You would get a modification of the size and substance.

Dr. Blank

But how are you going to point it out? Let's pursue the idea of the modification of size and shape of a substance. How are you going to do it? You can't tell this three year old that "the modification of size and substance...."

Participant

Does this table change? Is it still the same? If I do it here, what happens?

Dr. Blank

You're near, but a little bit off because the child has not been specifically focused on what he should be looking for. Let's pretend that I'm a three year old. Tell me what I should be looking for. I don't know what hard means. You tell me. Give me the actual instructions.

Participant

The cotton and the table.

Dr. Blank

Yes. Now you be the teacher.

Participant

I would probably have to imitate the tap. (TAPS ON TABLE.)

Dr. Blank

But say the words you would use with the child!!! This is absolutely critical.

Participant

Okay. All right, I would say this.
(TAPS ON TABLE.)

Dr. Blank

No. Tell me what to do. Remember what I said before. You give about five seconds of verbal information.

Participant

All right. I would do that. (TAPS ON TABLE.) Now you do that. Make believe you're a three year old.

Dr. Blank

I'm a three year old.

(THEY TAP BACK AND FORTH.)

Participant

Was the sound different?

Dr. Blank

What?

Participant

Did you hear something different?

Dr. Blank

I heard something.

Participant

I give up.

Dr. Blank

Sounds are stimuli in the auditory realm and they are infinitely difficult for young children to consciously discriminate. That's why you're in trouble. When you got into touch before, I said, "Good, you're on the right track."

I'll tell you what I would have done in teaching "hard." I would have taken a table. I would say, "Let's try and bend the table. You try it." If he doesn't know bend, you say, "Push it down like that. Okay?" ..."Did it move? Did it change?"...He doesn't have to understand the word bend. He understands the meaning of what this action means. The referent or mediator or function for "hard" could be that it "doesn't bend."

In general, in the case of things (nouns), the key mediators are functions of the thing ("food is to eat," "clothing is to wear," "tools are to fix things," etc.). Help in this area need be minimal, however, since the child finds the labeling of things to be relatively easy. His greatest confusion arises not from concepts dealing with objects (nouns) but from those dealing with actions (verbs) and attributes (adjectives and adverbs). This area includes the common preschool concepts of size, direction, shape, speed and sequence. A reference point for the teaching of these concepts must be found which is comparable to the usefulness of function in teaching objects. This reference point seems available in the use of clear perceptual or motor referents. For example, the referent for hard, as we mentioned, can be the inability to bend the material; the referent for sharp is that it hurts when you put it on your finger; the referent for smiling is an upturned mounth; the referent for top is that you go up as high as you can on something until you cannot go any further.

Now, once the child has the mediator, and is able to apply the concept to very similar objects or things, the next step is to present non-instances or negative instances. This tells us whether the child has begun to grasp the concept. Negative examples also serve to create a background which gives the concept being taught greater salience for forcing it to the foreground.

Let's take apple, for example. What's a good non-instance of apple? Remember, the rule for selecting a non-instance here is that the mediator doesn't apply. Now most would say pear, orange or banana as non-apples. This is confusing. The mediator for apple is something you eat. But that's the same mediator for pear, banana and every other fruit. We've got to avoid using members of the same superordinate grouping in selecting non-instances of a concept. If you don't avoid it, you're just going to set the child up for trouble.

A good non-instance of an apple would be a rock, an ashtray, a pencil. Anything that could be put on the table to contrast with an apple, but that is clearly not edible.

Let's take top, a concept that is difficult to teach. What is a good non-instance of top? What is your first reaction? Bottom? In general, all of your immediate associations--the first things that come to your mind, like bottom--should be avoided, because they are precisely the wrong things. They share too many of the same qualities. Thus, even though top and bottom are opposites, they also share the major quality of being the "end points" of a thing. Now, if the mediator for top is you go up as high as you can on something until you cannot go any further, then any point below the top would be a non-instance of top.

We had a big controversy in the planning of Sesame Street-- a controversy which I lost. Whenever possible, they teach by opposites--

up-down; in-out; big-little, etc. This pairing confuses the child.

In general, all items that might possibly share the same function should be avoided at this point. This means that items from the same superordinate grouping should not be introduced together. For example, let's say I am to teach ink. I wouldn't teach paper as a non-instance because ink and paper are too closely associated with the entire writing situation.

The next step is the extension to less obvious instances. What is the rule? It is that one selects less obvious instances -- less obvious in the sense that they don't look like the original instances you were talking about. But nevertheless, they can be covered by the same mediator. For example, what is a less obvious instance of corner, if we have initially used as our example "corner of a room."

Participant

Corner of a table.

Participant

You can't walk the corner of a table.

Dr. Blank

Wait just a second. He can walk it with his fingers. So you say to the child, "Find me a corner on this table," and he may just look at you. And you say, "Remember? What do we have to do with a corner? Just start here with your fingers. Start here. Start moving. Keep moving, moving, keep moving. What do you have to do at this corner? You have to turn. What do you think the corner is?" And he usually knows. If he doesn't have it, stop teaching. If he can't make that jump, there's something wrong. His concept is inadequate. If he can't do a reasonable extension, there's something wrong with either the teaching of the child at that point, or his grasp of the concept.

Once the child is able to handle three or four potentially confusing, less obvious positive instances of the concept, he must be led to recognize the limits of this extension. This can be achieved by having him judge potentially confusing negative instances of the concept.

The potentially confusing negative instance is interesting in terms of perception. It looks like the thing (it isn't grossly different like the ashtray and the apple), but it lacks the function. If we're teaching pencil, a subtle negative instance might be a long, thin stick. If top is being taught, a subtle negative instance might be a position almost but not quite reaching the top. If square is being taught, a subtle negative instance might be a triangle.

Participant

Aren't you referring to "why" here? You have a negative example, for instance, pencil versus stick. You ask, "Is this a pencil?" and he says, "no." Then you carry over into the why. "Why isn't it a pencil?"

Dr. Blank

You don't have to ask "why" in this instance. If you're sure the child knows "why," you can ask it. But it's not essential that he justify his response.

Participant

Why not use a pencil with a point, and a pencil without a point?

Dr. Blank

You don't trick a child. A pencil without a point is still a pencil. What I would do in such a case is point and say, "This is a very funny kind of pencil. Remember the other pencils? Look at this thing. Does this have it? And now I'm going to teach you something that's really fantastic. I'm going to teach you how to make this point." And I go to the pencil sharpener. So, I do not use a pencil without a point as a non-instance of a pencil.

Participant

Right. But the sharpener must be there. To me, a pencil without a point is a much more honest learning situation than taking a stick...

Dr. Blank

No. I think you're confusing the distinction between a positive subtle instance and a negative subtle one. The positive subtle of a pencil is a pencil without a point because quickly, with no tricks, and an intriguing thing(the sharpener) we can make it into a functional pencil. That is not a negative; it's a positive. A stick is a subtle negative instance of a pencil and it's not a trick.

Participant

Except that there are sticks that do write and Indians make use of it.

Dr. Blank

Fine. This is finally when you get into problem solving and into the sixth step in the sequence, which is extension of category. Once the previous levels have been obtained, the concept can be extended so that the child sees its relevance in the scheme of things. In the case of attributes, the child can be led to appreciate the significance of the characteristic in situations in real life. This can be achieved by creating problems where the information he has gleaned becomes vital to some adaptive behavior (e.g., "Okay, let's see if this small cup can hold all this water"; "Can we walk through the doorway when the door is closed"). In the case of objects, the child can be led to a beginning grasp of superordination. This extension can be achieved by combining the verbalized mediator with the concept of not (e.g., "now, let's find something that writes that is not a pencil"; "Now, let's find something to drink from that is not a cup," etc.).

Let's get back to the stick that writes. You can set up a situation where you can use the stick like a pencil. This would involve getting sand, and the child pours out the sand which he loves to do. He then draws a shape in the sand, and draws a shape on the paper with a pencil. This can be an interesting problem solving lesson. What you're really showing is that the stick is not a pencil but it can be made into a writing implement. You've got to help the child make these distinctions.

Participant

Using this whole system to teach a concept to children, I think I'd be overwhelmed as to how much there would be to do, and how spontaneous and quick I'd have to be to be able to sort and to make discriminations to come up with another group of examples, to retrieve another repertoire, to try and restructure mistakes. Have you run into people who can do this, and how long did it take before they became proficient at it?

Dr. Blank

I've had a long history of unsuccesful efforts to try to convince schools to do this kind of training. It is "doable," and the rules are not that complex. It takes approximately four months of training of a teacher who has already been preselected for certain qualities. There are a lot of people who can't get into it because it's quite a high level of teaching. But that would be true in any field.

Our teachers are preselected for two qualities. One is the ability to handle the intricacies of language. In other words, to appreciate how to reformulate things in an infinite number of ways at the simplest level, which is very hard for teachers to do. The other thing we look for is spontaneity. With these skills, we can begin training. The training is difficult; it's very much like what the child has to go through. He gradually internalizes the rules in the teaching so that after awhile he suddenly doesn't need to go through each step, but he sort of leaps. This is very much what the teachers do.

The training is very much clinical-type training. You take real children, try ideas out, and then see what went wrong with the situation, and to develop alternative techniques. Then the teacher goes over this and over this and eventually generalizes the rules.

I personally don't think that four months is a terribly long time to make a good teacher. But systems are not designed to allow such lengthy retraining. They say that they'll give you five afternoons over the year and to train their teachers.

Interestingly, one of the things that I've found is even if this isn't adopted as a method of training children, it's the best method of training teachers. What happens is the group salvages the teacher, and she never has to work with the most poorly functioning child. Because if the teacher can work with the worst functioning child, she can work with any group of children.

What I've tried to do in these sessions was to present a sequence of rules for teaching concepts and some of the teaching principles involved. Although I would of course like you to incorporate these rules in your teacher training, what I believe is more important is that you commit yourself to some set of rules or principles in teaching so that we can begin to systematically test ideas in education rather than relying upon vague and undefined notions.

Blank, M. Teaching learning in the preschool: A dialogue approach. Columbus, Ohio: Charles E. Merrill Publishing Co., 1973.

SUMMARY OF CONCEPTUAL DEVELOPMENT AND APPLICATIONS TO HANDICAPPED CHILDREN

Developed by participants

Types of Concepts

Objects; Actions; Attributes: size, shape, same-different, directionality (up-down, in-out, etc.), relational (big-little); Number; Adverb (fast-slow); Classification; Negative; Auditory

Same content for handicapped

Prerequisite Skills

Sensory-motor relationship; Associative learning; Ability to ignore irrelevant cues; Ability to generalize to similar instances; Visual discrimination; Auditory discrimination. Problem in brain-injured and retardates.

Memory. Short-term memory problem in retarded.

Communication Skills

Visual

Discriminates figure-ground. Problem in the brain-injured.

Attention (visual, tactile). Problem in the brain-injured and retarded.

Linguistic

2- and 3- word phrases (receptive language; commands of attention and action. Special problem in deaf; language lag in retardates.

Imagery

Delayed imitation; recognition. Problem for blind because it is on a tactile rather than visual basis.

Interpersonal

Willingness to enter into an interpersonal relationship. Problem in the disturbed; lag in establishing relationship in the blind. An asset in the retarded ("outerdirectedness").

Problems in Learning Concepts

Poor auditory discrimination; Unselective generalization; Memory-rigidity which hinders shifting; Difficulty in focusing attention; Salient attributes; No incidental learning. These problems are intensified in handicapped children.

Teaching Strategies

Do not use the following methods for teaching strategies: (a) Rote teaching of attributes explaining a concept using other more difficult concepts; (b) Use of a problem-solving approach -- as in a concept formation task. The child comes to the teacher with concepts he has taught himself. The teacher has to help him label these concepts. It is harder for the child to learn concepts from the teacher because her instructions are an extra "cognitive load." The task must therefore be kept simple.

Blank recommends teaching concepts through the use of a sensory-motor strategy. This involves using function as a mediator for a concept and reinforcing it with a label (e.g., to teacher "corner," have child walk along the wall to the corner of room and say "turn" as he gets to corner). In choosing concepts to teach, make sure their functions can be demonstrated. Blank's teaching strategies can be applied to the handicapped. They seem particularly well-suited for these children because they have a sensory-motor base. However, they would need adaptation in terms of breaking down tasks into smaller components, more practice with the same concepts, etc.

Some General Strategies for Teaching Concepts

1. Show child an instance of the concept by demonstrating action and labeling it, then have the child imitate.
2. Present similar instances with others that contrast clearly with them.
3. Extend instances to more subtle examples (e.g., teach pencil by contrasting it with a long, thin stick).
4. Present negative instances (e.g., ask child to find something that is not a ball).

Additional Strategies

The initial step in teaching concepts is to get the child's attention. Some handicapped children have a special attention problem. Useful Techniques: simplify background; use objects that are large, colorful and attractive; sometimes singing can help to focus a child's attention.

Don't just verbalize concepts. Demonstrate them and add verbal mediators. Lack of verbal mediators is a serious handicap for the deaf in learning concepts.

In presenting contrasting instances, use to emphasize contrast (e.g., a striped red object as contrast to a green one). Give small bits of information. Retardates will need more redundancy in materials than normals.

Make sure child is not simply responding on a contextual basis by shifting the context each time you present a concept. *Retardates are especially prone to be associational or contextual learners so this would be a helpful technique to use with them.*

Encourage the child to reject incorrect responses. *Handicapped children tend to have less autonomy than normals so this technique might be unsuitable for them.*

Make sure the child not only has a concept but can apply it. *This is a special problem for retarded children. They would probably need extra practice in learning to apply the concepts they already have.*

Give child practice in picking our figure against background. *Useful techniques here are: (a) starting with a simple background and making it more complex; (b) give child cutouts from which he has to pick out those related to a story, which are then made into picture.*

Encourage imitation by the child. *If an emotionally disturbed child will not respond, it may be helpful to start off by imitating him.*

To teach auditory concepts, associate sound with action (e.g., sound of drum with banging stick).

With regard to the role of memory in learning concepts: *Retardates have a short-term memory deficit. One technique would be to encourage them to "rehearse" each verbal mediator several times when* he first hears it.

LANGUAGE DEVELOPMENT*

Dr. Harry Beilin**

I would like to talk with you about how some aspects of language construction are being studied by a number of researchers. I'm concerned about the way in which language structure is affected by the child's experience at home, where the models for the child's language exist. The school on the other hand is the place where language development occurs once the basic system is already established. The fundamental systems of language are ostensibly already there when the child comes to school. In language acquisition, the parent does not act as a reinforcing agent in any critical or effective way. Parents do, however, correct and expand on the child's speech. For example, daddy goes to the office. The child says, "Daddy office." Mother says, "Daddy went to the office." She emphasizes the omitted words, putting them in or changing the ones that seem to her to be incorrect. It is a very common parental habit. Even if one doesn't wish to do it, it can hardly be prevented. In my own experience I have expanded and corrected my older child's speech during the critical years of 2, 3 and 4. I would look him in the eyes and try to make clear to him what I expected him to say. He would completely ignore what I was doing. Now that he's five, he does change words on request to make his sentences grammatical when they are not.

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*The first session on linguistic theory and its psychological implications was lost due to a faulty tape. The summary below is based on the remaining sessions.

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Some researchers say that in expanding and correcting, parents communicate information to the child of the read world more than about linguistic form. If this is so, then naturally the child will learn more about the real world than the linguistic one.

Participant

If models aren't essential for language acquisition, how does a child without a model acquire language?

Dr. Beilin

There is no question but that the child has models. The person who is speaking, however, is a model only if he's imitated. It is not at all clear whether the child follows and imitates exactly what is said. There are some elegant theories about the nature of modeling and its effect on language, and they are coming closer to what some other people say accounts for language acquisition. The child is said to perceive the elements of the linguistic symbol system and he abstracts the nature of the rules within it. That is not really modeling. There is very little actual imitation within this notion. Recently, there has been a great deal of research on the effects of modeling on language behavior. Most of the studies show that one can affect language change through modeling and reinforcement. One first has to have the child copy the model. That is, really have him imitate. If he does, the basic linguistic knowledge that he already has is reinstated and reinforcement establishes it at an observable level. There seems to be pretty good evidence that you can affect such language change through modeling. This applies, however, more to language development than to language acquisition. Once certain grammatical elements are in the child's repertoire, they can be expanded upon and developed.

Participant

I think we have to look into differences in children's language. There are some children who do imitate as opposed to children who don't. We need to look at the child's strategy. Many children have different strategies.

Dr. Beilin

Lois Bloom at Teachers College, Columbia, conducted a study recently that shows individual differences in imitation. She says that there are children who imitate a great deal relative to other children, and some children who don't imitate at all. There isn't much known about the nature of imitation and how it affects learning, although it is evident that a large number of children do not learn by imitation at all. Their language thus cannot be accounted for in that way. It may be that imitation acts as a kind of supplementary system for processing language for some children, while it does not for others. The facts seem to indicate, then, that the true cause-effect relations for language acquisition are not known.

Participant

Imitation might or might not be right for some children, but might have its place in the developmental scale for children.

Dr. Beilin

There again one is involved with accounting for language acquisition. If there is only one process that accounts for language learning, then every child has to have it. But if different processes are involved, then one may find different styles of acquisition, and one can train according to the style. If imitation were one of the styles of learning or a true agent of linguistic knowledge, then one could take advantage of it. At the moment, however, we do not really know the critical agents in the process of acquiring language. We have a set of processes and a set of theories but little in the way of positive facts.

There are people working actively on modifying language behavior, as I indicated. They are able to make modest claims for very restricted contexts. Bear and his colleagues, for example, report in a recent book on the language of the mentally retarded the results of a study of teaching pluralization rules to children with enormous language deficits. They showed it can be done. They did it first by motor imitation of sounding -- making the appropriate sounds. For example, in pluralization one has to learn to sound /s/ and /z/ because these are the phonetic elements in pluralization. This was followed by verbal imitation, sounding the words and then labeling. Then they concentrated on the grammatical rules. They learned the rules through imitation of the teacher, with accompanying reinforcement. It has worked. But to my knowledge, nobody has ever trained a pluralization rule or any other grammatical rule for which there already wasn't evidence that the child already had or could have the rule in his repertoire.

Participant

This would include work that is being done with autistic children in California. The assumption there is that the rules are already there. There's something else blocking them.

Participant

Let's get back to models and speech. Children's patterns, their rate, their pitch, their inflection, the tempo and even the timbre of their voice is definitely correlated to the people they hear around them. For example, if there is a lisp in a parent, 99 percent of the time you're going to get it in the child, and that's the only place he could have gotten it from.

Dr. Beilin

The child is following what the model says. The question is how did he pick it up from the model? I'm not saying that he doesn't model. He models. What we don't know is the process by which he does it.

In other words, the child grows up speaking English in this country. He doesn't speak British English but American English. In a home where they are speaking a dialect, he will learn to speak that dialect if he doesn't hear anything outside. It is interesting, however, that many children pick up the language outside the home and learn to speak in a way their parents do not speak. Take a child who speaks in a particular dialect at home. In school, however, he will learn the language spoken in school. The critical question is how he does it. If you say the child does it by imitation, that doesn't help you very much because it's clear he doesn't take what the parent is doing and then mimic it. We often think of imitation as mimicry. The child doesn't do that. In a broad sense, if his language is very much like adult language, then in a sense imitation has occurred. Nobody fully knows the processes that are involved, however, and that is where the problem is.

If you give a child a sentence to imitate, what he does is translate it according to the knowledge he has at the time that he imitates. For example, you say to a child at a very early age, at three years for example, "Susan is hit by Mark." The child will say, "Susan hit Mark." What the child does is take what he hears and translates it according to the grammatical system he has available to him. At this point, he doesn't have the knowledge of the linguistic rules to help him to really copy the sentence properly. This is a very powerful argument against the idea of learning through mimicking language, or imitating language the way it is heard. When you talk about imitation, you are really dealing with a rather global term that nobody really fully understands.

Another very interesting phenomenon concerns errors in children's language. Children do not make any more mistakes in their speech than do adults. The child's speech sounds like very deviant language only because it is not the way the adult speaks, so the adult thinks it is full of error. It is not. The child is operating by the rule system of his stage of development. If you can define the rule system for the child, you find that there is considerable regularity in relation to that rule system. He doesn't deviate very much from it.

Participant

In addition to gaining knowledge, children use language to make order out of a fairly chaotic environment. It is a way of clarifying for themselves what they're doing. Young people operate on this knowledge-getting technique, and it is very closely related to how we get this knowledge. It doesn't stop at the point when they ask the question; they'll wait two, three weeks and come back with the same question on a much higher level. What happened in between? They didn't read a book.

Dr. Beilin

When a child doesn't have language, he controls his parents by crying and screaming. If he wants attention, he has techniques for dealing with adults in this way. When he begins to have language, he cannot only control his parents, but also other people. He can control the world in an enormously extended and much more subtle way. Language aids him both to organize the world and to control it, and also to understand it. In language, he has words which aid him by encapsulating ideas. The child first gets the word as a label. First the word is simply a label, a conventional tag placed on an idea. But when you give a child a label, you don't necessarily give him the idea. This is a very important thing that is still misunderstood by people who work with children, particularly these days when there is a great deal of emphasis on labeling in preschools. If the child doesn't understand what a label stands for in a way of a concept or in a way of an idea, he has been served to very little purpose, or to no purpose at all. One can sometimes give children labels and if they can learn the idea associated with it through an enriching experience, then it can be helpful. When the child does have the word as well as the idea, he has the potential for viewing the world in a rather profound way. All of this is important and is why many people intuitively feel that language is so critical to the child's development. Many feel that if there is nothing else that the child learns, he should learn his language: to speak it, to read it, to write it. I want to emphasize that it is misleading to focus only on language and not on the fundamental base on which language rests, that is on the underlying concepts and conceptual systems.

Participant

In terms of processes of modeling and imitation, is it simplistic to suggest that they relate primarily to the development and evolution of the surface structure. The generation comes from the deep structure and the rules that are provided. These rules are translated into some kind of surface structure which then become sophisticated and evolve through the processes of imitation.

Dr. Beilin

The critical question is how basic structure rules come to known by the child. They are not in the sentences themselves. They are abstractions of the relations among sentences. The difference between an active and a passive sentence, for example, can only be understood as an abstraction by comparing the form of one with the other. Some kind of transformation is necessary to derive one from the other if their meanings are the same. Knowledge of a very abstract nature is required that embodies these transformation rules. It can be abstracted only from a comparison of such sentences. For a child to compare sentences in this form consciously is out of the question. He has to be able to do it unconsciously. What I think you are saying is that imitation provides the child with what is necessary to abstract these rules.

Participant

That's what I was thinking. If you're going to make transitions from active to passive, this transformational change is going to be dependent on the language environment to make the adjustment.

Dr. Beilin

Very much so.

Participant

I think we're getting away from the point. I think many of us are more concerned about how children learn to talk, rather than they later are taught to learn. I'm more concerned about what to do with the very young child linguistically,and tricks of teaching mentally retarded children linguistic rules.

Dr. Beilin

First one has to know where in the developmental scheme you find the new learner, or the retarded child, or the linguistically impaired child. The major thrust in instruction, it seems to me, has to be in terms of some cognitive preparation, understanding the nature of the real world and the way it is represented. One deals with linguistic form secondarily. Once you are sure the cognitive apparatus is there, you can shift to placing greater emphasis on linguistic form.

Participant

But we haven't progressed beyond the early stage of sensory motor age with some of these children to know what the cognitive correlates are of language at a later age.

Dr. Beilin

That's true, but we are beginning to have some idea of what some of these cognitive correlates are. What we need, however, is a strategy for instruction. Although one must be concerned with linguistic instruction per se, the basis to linguistic knowledge, particularly at the very earliest ages, is the child's developing cognition. Thus, there is always a cognitive element involved in language. That's what we talk about in referring to meaning, that is to semantics in language. If one is interested in writing a sentence, the interest is in communicating some thought. The same is true for the child's linguistic production. The question really is, what is the idea that has to be represented and what is the best way linguistically of representing it? The focus has to be on what the underlying message is, as well as the form of its representation. A sentence is really communicating a message. So one has to consider the nature of the message, as well as the medium in which the message is transmitted.

Participant

If a child makes an error in his spoken sentence, which do you change?

It's like correcting a composition. You're correcting it and making it grammatical, assigning a number to each part of speech. You therefore are changing the child's language. Children talk because they have something to say. They talk because they finally have gotten enough experience in their world, and they know something about their world.

Dr. Beilin

Some educators feel that teachers should correct children's errors in the early ages. If you start correcting them immediately, however, there are the social and personality consequences that must be taken into account. It must be borne in mind that one is dealing with a human organism who is terribly sensitive to what is said to him. Children who are mentally retarded or have any kind of handicap are doubly insecure about themselves. So if one starts correcting them, it has to be done in as minimally a threatening way as possible. Teachers should probably hold off on such corrective procedures while the productive aspects of their language are being learned. During these periods when the child is being productive and creative it is probably best to allow these processes to develop without inhibition. Later, when the acquisition process is more or less set in, then one can introduce corrective methods since at this time the child is still very plastic. If one waits too long, however, it may be too late to change a system that has set in. A great burden is thus put on the teacher to be sensitive to what a child is saying. Piaget made a great contribution to education on this point. He says that when a child answers a question, one must try to determine what question the child is answering. The child may not in fact be answering the question you asked him. If he does not have the intellectual structures to comprehend the question, he may answer another question he has formulated. This is consistant with the structures that are available to him. I have seen teachers who have completely missed what a child is saying. They correct the child when in fact the child has given a completely appropriate answer, but to another question. Most teachers know that they often have to reformulate questions so that children can understand them. She often has to provide the basis, in fact, for the comprehension of the question itself.

Participant

You said that many teachers have all the techniques to develop language, once the child has the simple rules. You also said that we must differentiate between language acquisition and language development. How in our instructions can we differentiate between the two, and how can we help the child acquire language?

Dr. Beilin

First of all, a person working with children in a corrective context has to diagnostically determine whether the problem is one of development, or one of acquisition. If the problem is one of development, he can actually use a number of effective devices. If the problem is one of reconstituting and focusing on acquisition processes, it is much more difficult.

Participant

Can we continue on this point? Can I give my staff any kind of guideline, any research, anything to go on because they don't know which way to turn.

Participant

I want to add something because we're talking about the very handicapped, the multiple handicapped, and we really have been talking about expressive language. In our work, we've even gotten into acquisition of receptive language, or acquisition of gestural language which is the level most of our children are at. So I'm concerned.

Dr. Beilin

On can ask whether there is a structure in gestural language. Gestures may be thought of as constituting the elements of a language. It may also have a syntax that ties together a number of terms in it. Gesture language is, in a sense, a sign system. It has meaning, and most people understand it. Children learn these systems and adults learn them. People who have no other form of communication, of course, use gestures in a way that become critical to them and gestures take on more of a symbolic function. When gesture begins to represent ideas in a more formal way, then it may be said to constitute a formal communication system as in fact is used by the deaf.

On the question of receptive and expressive language, there is considerable discussion as to whether children can really understand before they produce language. Some argue that the child prior to producing language simply understands actions of objects (including people). They do not really understand language in a formal sense. What the child is doing in this preproductive period is establishing the predications on which language will later be based. That is why people have dropped the distinction between receptive and productive language.

It does not appear that there is a period of receptive language that precedes productive language and it is not clear that the capacities for receptive language are any different from those of expressive language. In addition, we do not have a very clear understanding of what is meant by comprehension. We've placed too much emphasis on what a child says and the processes involved in saying it. Too little is known of the period prior to that when the child is gaining understanding of what occurs around him. That is, the child interprets meanings related to adult action through some kind of communication. How this is achieved, however, is not very well understood nor do we know how to use such knowledge in educating children.

Participant

Everyone wants a strategy to work that will reach children. But it seems to me that by making a dichotomy between language acquisition and language development is doing ourselves in. There doesn't have to be a dichotomy.

Participant

One cannot say easily that a child has acquired language at any particular point. For one, no one believes that a child is born with abstract knowledge of sentence structure.

Dr. Beilin

Rather, language acquisition is a process of construction. The process is not fully complete in respect to the basic linguistic forms until about the age of nine or ten. The construction or acquisition process involves a progressive internalization or externalization of these forms, such as the passive or negative. Even for adults language is never fully developed. Once a linguistic form is acquired, there is development of the form and expansion of its use. We can make a distinction between the original statement of a form and its development once the form or some element of it is present. I think it is reasonable to make this kind of distinction. The point you made is valid too. In other words, it's wrong to say that the acquisition process is one that takes place within a very limited period of time, and from then on it's all development.

Participant

It seems to me that language is developmental, often from the time the child is born until he reaches adulthood. If the child has not reached a certain stage, we must make our instruction to children on these developmental priorities. We cannot jump ahead and start with naming with mentally retarded children or with deaf children. It has been shown that the single-word utterance stage is not an acquisition but covers the whole stage of development.

Dr. Beilin

You're making a very good point. Every one of the processes undergoes development. Even such an ostensibly simple process such as labeling is not simple but profoundly complex. The functions of one phase of language development are different from another. Any division between such levels, however, is arbitrary; particularly if we call one period acquisition, and the other development. If one examines the linguistic at a particular time, one finds qualitative properties that are different from those of later and earlier periods. Comparing levels provides one with an understanding of the developmental process. As a rule, one takes the qualities evident in a particular period and forms some kind of generalization from them. This is done for two reasons. It has value as a device for understanding what occurs at a deeper level, and it also has important uses as an instructional device. Such generalizations can be misused, however, both intellectually and practically. We are naturally concerned with misuses of such ideas because there is a tendency to misuse them, it seems, before they are used properly. Sometimes, however, we tolerate some such misuse in order to get extensive use of a new idea. Nevertheless, one must have a conceptual framework from which to operate practically in order to have a basis for what one is doing. Otherwise, one's practice tends to be inconsistent, arbitrary and capricious. Again, in respect to acquisition and development, one can usually show where the transitions take place between not having knowledge of a linguistic form and having knowledge of it. The evidence is fairly clear that for clearly differentiated linguistic forms, one can establish a consistant order in which they are acquired. There is , thus, legitimacy in looking for acquisition of a form at a particular time. One can feel fairly certain that such a form will be acquired only after another form or set of forms has been acquired.

Participant

I'll buy that. I think, however, many of us fall back on acquisition of language per se. It's much more important to see where the child is in this mainstream.

Dr. Beilin

The distinction I was making was not between having language and not having language; rather, I've talked about having knowledge of a particular linguistic form as against not knowing a linguistic form. A child always has language once acquisition has begun, but it is not clear where the acquisition process starts.

Participant

Can we look at some of the commonalities among children that we have gotten from research in child's language development?

Dr. Beilin

For one, language is rule-governed. There are two critical rule systems. One is a cognitive rule system. After a set of such cognitive resources is established, then the linguistic rules are acquired in some fashion.

Participant

In the beginning, you're not concerned with rules.

Dr. Beilin

In referring to rules I don't mean teaching rules to children. Instead, they acquire a rule system that governs their language behavior. We are not clear about what the rule system is, but we know they acquire these linguistic rules in some fashion.

If you want to give a child competency in dealing with the world, you have to start at the place where cognition starts. Cognitive resources are acquired through various encounters with the physical world. Physical knowledge is acquired through a physical encounter with the world.

One thus learns about objects; about their size, weight, color, texture and so forth.

Participant

Young children do not talk about size, shape or color in a naturalistic setting. I think we have to get more basic than that in talking about teaching language.

Dr. Beilin

When you talk about teaching language, you first have to talk about learning about the world. One first learns something about the nature of the physical world in a non-linguistic way. If the child has to learn about the physical world, he learns about it through a physical encounter. There doesn't have to be language present. One has to provide the child with materials to hold, to work with, to manipulate, to react with, to bang, to break, to tear up and so on.

Participant

This is what we as teachers make a mistake about teaching. We insist that children verbalize. I'm saying it's a bad place to start.

Dr. Beilin

Right. But what I mean by physical knowledge is not the kind involving comparison of objects and conceptualizing them in terms of their qualitative properties. This is a much later development. This is very sophisticated. My recommendation is to start a child in a free environment with things carefully chosen by the teacher, or by whoever establishes the setting. One provides materials so the child will learn something from them in the process of manipulating. He should learn about the physical properties in a very direct encounter. The child carries out an action in which he learns about the physical properties of things. But, he doesn't have to verbalize about them in the beginning.

Participant

But this is something I don't think special children can do by themselves.

Dr. Beilin

First, one puts them into this environment and allows them to be by themselves. This offers them a sense of freedom and security in the environment. It also gives them the opportunity to explore. You make it available to the child even if he just sits there and refuses to do anything. You at least establish that there is a world out there. They have to learn that there is a difference between themselves in that world. They also have to learn that the world can be manipulated. Once they have established some contact with it, that is the time to move in. That's the approach I would use. The child will begin to manipulate objects and things in relation to himself, or to other objects. The child has to learn that he is an object too. He won't recognize this at first. He will think that he's only the subject, or agent of actions. You can, however, manipulate the roles with children so that they are both subjects and objects. Once you come to the point where you are involved with the child, or he is involved with objects, you can then control and manipulate these roles. He will then learn something about object-subject relations.

There are essentially three elements in such a relation. There is the child himself. There is the action, and there is the object. Hopefully, the action relation will ultimately translate itself into a sentence relation that will have a subject acting on an object. The objects are the objects of the real world including himself. The subjects are things in the real world including himself. The actions are either his actions or other people's actions. He needs a great deal of experience with physical objects before he feels the need to comment upon them to others and thus has need for a communication system.

We are not talking merely about colors, shapes, forms and the like. But, the child has to learn about the properties of the real world in order to talk about the real world. If one talks about 'hitting' things, one has to talk about things that he can hit. If you talk about breaking things, you have to talk about things that you can break. One can start with an impoverished word, or a rich one. Hopefully, you can enrich the child's experience by providing him with a variety of things he can learn about.

As I said before, one does not simply have the child learn labels. The idea is to first learn about the interrelationship between subjects and objects in a real physical context. When something is understood of the semantic relations, they then will be able to tag onto their knowledge the appropriate language. At this point, you become involved in a verbal exchange with them.

Participant

And it is so much better to use things that are natural to children.

Dr. Beilin

There is nothing natural to children. Or to put it more accurately, everything is natural to them. They take anything in their world and use it in their own terms. So it doesn't make much difference which method or what you use. I have found out that children have the most fun with simple things around the house close to them, like doorknobs, pots and pans, etc. Those are the things that engage their interest. A child knows how to manipulate them, or he will learn how to manipulate them easily. He is interested in them and can't quite figure out what to do with them. He wants simple things he can manage in some kind of creative relationship. He doesn't want complicated toys, except momentarily, because the toys do the work. The child wants to do the work. That's why children like pots and pans. They can put one inside the other, lay them out in rows, jump on them, hit them, and so on.

There are children who aren't at this point in development, however. Then, you have to engage them in this kind of activity. It takes an enormous amount of skill to carry it out. It has to be based on the assumption that you know what the goal is. The goal is to create an implicit understanding of the way objects are related in the physical and social world. He has to know in some abstract way that there are agents or subjects. These are things that carry out actions. There are things that receive actions, and there are the actions between them that may vary. The child must learn that the agents that play these roles are interchangable. Once you establish that the child has this understanding, you can move onto the next step.

Participant

The Head Start Program uses a linguistic system based mainly on labeling. Why do you negate that as a good linguistic system?

Dr. Beilin

If you provide a label for an object, it does not necessarily give the child any conception of what is involved with the object, its function or relation to other objects -- in essence, its meaning. If you go a step further and help children learn verbal rule systems and help them use them in problem solving, then fine. Labeling by itself is superficial. You can't introduce a system that is natural to the child by using labeling alone. Labeling has different functions for different children at different ages. Most words are used in different contexts with different meanings. Words also take on different meanings at various times. Often a person will use a word in a new way and really invent a meaning for it that people will understand only from the context.

You may say, when a a child learns he picks up the meaning of a word in context in natural life. That's all he learns anyway. We don't know very much about how a child learns. When you give a child a label for an object, he has little notion of what interpretation should be given that label except its associational value to the object. As an educational exercise, I think it is of the lowest sort. It isn't providing the child with a very powerful intellectual, or linguistic tool.

A label can be useful if it is understood to be used in a particular context or class of contexts. Naturally one has to provide children with words for certain things or else they won't be able to say anything. It would be better for children to first learn to relate objects and know their properties and then their labels, or at least both together. That is the key to language. A sentence is designed to express some kind of relation. That is wny I discussed the relationship between the subject and the object, mediated by some kind of action. This represents a relationship of one kind, and most of the things we express are relationships. They are not simply concepts. Concepts represent only one part of the mentality of learning.

Participant

Some people would say that giving a child a label creates something for the child. If I would say this is a castle, and we'd go out for a drive up on the hill. "There is a castle." Only because I have given him the word of the object up there does it take on reality.

Dr. Beilin

Maybe. If we start with a label and then we can explicate the meaning of it, fine. Then you really learn what the concept represents. The point is, an abstract label means very little to a child. Only when you have some kinds of representation that show him instances of it where you can point out some of its features will it take on any meaning to him.

Labeling as merely giving a word for something without understanding the relationship between the properties of the thing and the label is one thing. If you want the child to learn something of the qualities or characteristics of a thing, then that's something different. The best way to learn the contents of the class of properties or actions to which the label applies is to learn to differentiate it from closely related classes, and to learn the differing properties of the members within the class.

Participant

One of the problems in teaching special children is that they don't perceive the sameness and difference in things.

Dr. Beilin

What one should do with retarded children is start with the simplest kinds of concepts. One should start with gross perceptual differences between objects. Learning to recognize the same differences in other objects transforms this into conceptual learning. Learning about "same" is more difficult because it involves a somewhat different process. To detect a difference between two objects is easier than to tell how they are the same because, as a rule, they need to differ in only one property to determine that they are different. To tell they are the "same" -- that they are "not different" -- requires learning more information and more analysis of the object's properties. "Same" thus takes more time to learn, since more of the object's properties have to be known. It requires a good deal of cognitive training for what would appear to be largely linguistic.

Participant

It's evident that language is governed by a certain set of rules. Most are born with this innate ability to produce forms of certain structure and the ability to generalize things and learn things. But I think in special education, kids don't come with this ability. We have to build these in for the kids and somehow structure it.

Dr. Beilin

Most researchers these days question whether linguistic rules are innately given for any children. There may be some rudiments of a disposition to develop certain types of linguistic structure, but the form of this is unclear. Evidence indicates that language forms are constructed. Even the handicapped child has the ability to construct or elaborate a language. The handicapped child does not have a different set of processes from other children. His language construction will have to follow the same course as any one else's. The process is slowed down considerably, but no one really knows why. A great deal more work has to be done. The methods by which language is learned may have to be modified or utilized differently, however, from that of a normal child.

Participant

You suggested that not very much was necessary for language development; we could expect some sort of language where children are severely impaired in many ways. I feel as the very minimum the child must have is that he must move out of his "body space." I mean, he must move out of himself and somehow come in contact with his environment and interact with it. With many of our special children, we have to force this. We have to use artificial means to get him out of his body space and make this contact.

Participant

I think you also have to develop the need for language in the classroom.

Participant

I'm not talking about the child expressing himself. I'm talking about developing a language system.

Dr. Beilin

We must assume that language is there to express and to communicate to other persons.

Participant

But he has to have something to say. He just can't be motivated and want to communicate if he has nothing to say. The only way he'll have something to say is if he interacts with his environment.

Dr. Beilin

We need to recognize that in handicapped children there may not be much of a motivational system present. We have to help the child want to talk, want to use language, even if it's for internal purposes. In many cases, children don't want to, or are unwilling to do so. At the same time, one wants the child to depersonalize his experience and to objectify it. This requires a desire to make contact with people for the sake of communicating with them. This may be the motivational aspect. When one is able to objectify the child's experience, he will feel the need to communicate with people because they represent a means for making contact with the external world -- in fact, they are part of that external world.

You have to realize some children will not be able to function in a way that will be linguistically viable in the usual sense. You can make an assessment as to what is the minimum you can instate in such children in order to at least make them minimally functional so they can communicate.

What one needs to look for in the severely handicapped child is the point at which he is able to symbolize. Dramatic play may be the means to do this since dramatic play is really symbolic play. The child is able to utilize in this way a rather simple system for representative things and events. If one can get a child into symbolic play, one is at a good point for shifting to a language system, since language itself is dependent upon the acquisition of a symbolic system of a conventional kind. In addition, a great deal of problem solving is attained by methods that involve plugging in ready-made response systems. We thus serve the immediate function of helping a child solve the problem before him even though he may understand little of the actual logic of the problem. Sometimes the teacher may have to be satisfied by actually teaching language this way; that is, as a kind of algorithm -- like an adding algorithm in adding numbers. You have to recognize that in teaching some populations of children, one will not make language a creative enterprize, unfortunately. It may be very frustrating for teachers working with handicapped children if they expect to achieve the goals set for normal children. A teacher must accept the fact he or she may have to have different goals for different children. This attitude may make his job a little less frustrating and more meaningful for him.

Participant

Play activities and how children handle objects is a prerequisite for symbolic behavior. You can go back even to infancy with many of our severely handicapped children and look at the way they handle objects. You can see how they relate to objects and themselves and observe how they might use them somewhat symbolically or functionally.

Participant

This is the child who begins to make some contact with his environment.

Children can make contact and they don't even know about it. A child then needs some kind of interaction. With some children, they've had to use light, water, whatever turns the child on.

Dr. Beilin

When one provides the child with sensory experience with the intent of fostering intellectual development, it really puts the focus on the wrong part of the picture. One wants, instead, that the child comes to act on the world, to move out to the world. If he stays self-contained and is a passive recipient of sensory stimulation, he really does not go out in the world; he just stays within himself. If the emphasis is only upon the sensory aspect, one loses sight of the dynamic that exists between the stimulation and the response to it. What one wishes is an active response to stimulation. That ultimately becomes self-initiating.

Participant

A possible bridge between something the child can do and language development may be in the teaching of concepts. Marion Blank's group was working on this. You presumably start with something the child has and try to modify it or use it in relation to something he doesn't have. You assume that the child has some motor and kinesthetic activities. You start with the motor-kinesthetic characteristics as mediators. To teach corner, for example, you would use a kinesthetic mediator that says a corner is when you take the child and walk and the corner is where you turn. So you use the motor thing to define the turn. You then try to work off a mediator as soon as possible and go through a progression of:

where's another corner; or corner of the room; corner of the table, and so forth.

Dr. Beilin

We've talked about the transition from sensory-motor activity to dealing with things symbolically. This involves an enormous leap and the progression has to be rather slow in some cases. The example you gave is a nice way to represent an idea in action or through an activity. But the rule of turning the corner has a different meaning actually from a corner in the room.

Participant

It's where you turn.

Dr. Beilin

Yes, but two meanings are implicit in the word corner. For one, it's where you turn, and the fact that one turns is a second meaning implicit in the first. The turning is an activity, the other is a place. The child doesn't really have to understand the subtleties of the difference in meaning at first. If he first understands the more general characteristics of qualities, he can differentiate them later through further experience. We can accept giving him the label, as long as it ties to some kind of conceptualization.

Participant

Before you can start to develop any type of language on a receptive or productive level, the child has to have some understanding of same and different.

Dr. Beilin

The concepts of same and different are, at some levels, rather complex. On the other hand, the concepts of same and different can be quite primitive and simple. The concept of same is based upon the notion of matching. Knowing that two things match can be understood on a rather primitive level without the need to conceptualize the criteria by which matching occurs. Internal processes, so to speak, establish this match. If a match does not occur, then one can expect a "different" response, rather than "same." It is possible to say that the earliest perceptive encounters with the world are based on these distinctions.

Participant

A child could never move out of his body if he didn't perceive himself as something different.

Dr. Beilin

The same and different notion is really a process involved in classification. Things which have common properties are the same. To establish that things are the same is an enormously difficult task for a child. It's much easier for him to establish that things are different from one another because it involves what some psychologists refer to as self-terminating search. Once one property that differs between two things is found, the search ends. If no such property is found, the search has to continue until all properties are checked out. Only then can "same" be the response. It is thus easier to process information in regard to different, than to same. One is processing the properties of a particular class, or the properties of a system.

Participant

But a child has to learn to match. He has to perceive the sameness and difference in objects.

Dr. Beilin

There are two processes that have to be differentiated here. One is the process of discrimination, and the other is a conceptual process. The ability to discriminate between two things is more primitive. Being able to tell that two things are different from one another without even saying that they are different is a perceptual process. One can call it a simple learning process. A rat can do it without telling you why. Most living organisms can discriminate same from different. It is one of the properties of living things, at least in the animal kingdom. This represents one level at which one trains children, whether purposefully or not.

But knowing the criteria or conceptual basis upon which discriminations are made is an intellectual process that is more difficult and complex. One is involved here with the abstraction of common properties or the properties that define difference. These abstractions of course first require the ability to make perceptual discriminations. Whether it is necessary to have a child learn the conceptual categories that underlie the ability to discriminate is an empirical, practical question. That is, it is not certain whether in teaching language it is necessary that children acquire both the ability to perceptually discriminate and conceptually discriminate. In working with handicapped children, it may depend on a variety of considerations. In some circumstances, one may not wish to deal with conceptual properties at all but solely the perceptual; in others, the conceptual characteristics of a perceived situation may be necessary for problem solving or other forms of reasoning.

Participant

We can teach retarded children, let's say, 1st, 2nd and 3rd grade reading. After they begin to read, something happens with their reading skills. They retain a certain level. The reading that they achieve is in many areas functional. I happen to believe that we can go way beyond. I would want them to be able to read a book for the purpose of gaining knowledge. We have not achieved that.

Dr. Beilin

One always has to recognize that the human brain has enormous capacity. We never really exploit the full child's capacity, not even the handicapped child's. The full range of human potentiality is not at all known. I have no doubt that in another 500 or 1000 years human capacity and ability will be expanded profoundly. When you think of it, we utilize our brain relatively little.

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SOCIAL AND EMOTIONAL DEVELOPMENT

Dr. Robert Liebert*

I want to give a presentation so we can have a common body of facts and information as a starting point of our discussion. I will talk about the socialization process and how it works.

First, I will examine attachment, dependency and emotional bonds in early life and implications these have for the child's later behavior. I will then turn to a slightly older period and briefly discuss sex-role identity, development of assertiveness and aggression and its antecedents in early childhood. Finally, I will talk about origins of self-control, cooperation and other forms of positive social behavior.

Generally, I will be reaching two conclusions. One is that the first few years of life are very critical for the rest of the child's social and emotional development. When a child has unusual and unsatisfactory or impoverished experiences during the first few years of life, the child will require very special attention to overcome them later. Second, social and emotional development of the child is the product of many kinds of environmental experiences. It is very important how these experiences are learned, how they develop and how behavior can be altered.

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The child learns from the consequences received from the environment of people, and the consequences from the natural world. Also, a child learns from examples. Seeing others and how they act in a variety of contexts from the time the child is very young instructs the child; these examples provide the basis for significant aspects of emotional development and lay the groundwork for the totality of personality that we see later.

I would like to view the human infant at birth without any real component of social and emotional behavior (except in the rudimentary physical form), and without any kinds of social values. On the other hand, infants from birth are different in the kinds of social behavior and emotional reactivity they show. There is evidence suggesting that the happy, friendly baby tends to become the happy, friendly child, and then tends to become the happy, friendly adult, and vice versa. These are individual differences that can't be ascribed to any practices of the environment.

The early period of attachment and those first emotional bonds of the child lie in the fact that the mother, or primary caretaker, provides the immediate nourishment as well as the absolute physical needs of the child. During the first few months of life, the infant will smile or direct a pleasant look at a stranger as well as to the primary caretaker. Changes occur between the first six and nine months. This information was collected from mothers and systematic tests.

The tests consisted of someone going into the home and giving instructions to the mother, which entailed some kind of physical separation between the mother and the child. If the child moved to return to the mother, or primary caretaker, it was evidence for the beginning of an attachment. As the child develops an attachment to one individual, the broad friendship base disappears and the child tends to develop fear of strangers. On the average, the fear appears about a month after the first attachment.

Another important factor with this first emotional bond is a kind of warmth and psychological comfort that is different, and perhaps more important, than is the provision of food. The evidence comes principally from the work of Professor Harry Harlow and his work with Rhesus monkeys. They are in many ways similar to humans, and I think there is good reason to believe that the general pattern of emerging attachment is similar to that of the human infant. Harlow and his associates used monkeys because it would have been unethical to subject infants to deprivations.

Participant

When Harlow is using monkeys, we can't know anything much about the rejection of a child by the mother. Wouldn't that be a set of relationships that would affect the total experience?

Dr. Liebert

In certain ways, baby monkeys are going to be similar to humans, and in others they won't. There will be things we can learn from animal research, and other things we won't be able to learn.

In a series of experiments that Harlow conducted, infant monkeys were reared in virtual isolation. They got their food from one of two inanimate, synthetic mothers Harlow manufactured. One model, manufactured from wire, had a bottle of milk planted roughly in the breast area. A second model was covered with terrycloth. The monkeys had physical exposure to both mothers. Infant monkeys were then put into a variety of situations that frightened them. The monkeys immediately charged to the cloth mother and hugged her even though she had never provided any food. There is only one possible interpretation. The child has a need for a kind of physical comfort by contact that has nothing to do with food. From these experiments, one can conclude that physical contact plays a significant role in the development of early emotional relationships.

In another set of experiments, Harlow isolated infant monkeys for either three, six or twelve months. All the physical needs of the monkeys were met, but they were deprived of any significant physical contact or interaction with any inanimate or animate objects. After the period of deprivation, the monkeys were periodically put in with other monkeys who were reared in isolation, and monkeys reared normally. In Harlow's own words: "Young that had been isolated for six months adapted poorly to each other and the controls. They cringed when approached, and failed at first to join in any of the play. During six months of play sessions, they never progressed beyond minimal play behavior, such as playing by themselves with toys. What little social activity they do have is exclusively with other isolates in the group. When the other normally raised animals became aggressive, the isolates accept their abuse without any efforts to defend themselves. For these animals, social opportunities have come too late. Monkeys that have been isolated for twelve months are very seriously affected. Even primitive and simple play activity is almost nonexistent. With these isolated animals, no social play is observed and aggressive behavior is never demonstrated. Their behavior is instead a pitiful combination of apathy and terror as they crouch at the sides of the room meekly accepting the attacks of the more healthy monkeys."

Harlow remarks about the absence of any ability to be defensive or aggressive in the isolate monkeys. It is extremely important that we limit and teach children how to control aggressive impulses. On the other hand, being assertive enough to ward off attacks is a critical and positive aspect of social and emotional development. Without this ability, I feel you have an incomplete, incompetent and very likely unsuccessful organism in later life. For infant monkeys, the early period is a critical one. It's the time when social and emotional behavior is ripe to be formed. If the appropriate experiences fail to be provided, then you're in very deep trouble later in terms of being competent.

A series of observational studies of children left in foundling homes has also been made, and enlarges the picture. These children got food and some basic kind of care, but they had little physical contact with the usual mother or primary caretaker. These children showed impoverished social behavior and marked deterioration in their ability to perform, as compared with children raised under more normal circumstances.

Participant

How would you explain the effect that deprivation has on social and emotional behavior?

Dr. Liebert

We can't. It's a question that has not been resolved. It may be that the child misses more of the perceptual experiences that form the basis for social attachment. We have to become increasingly sensitive to all different aspects of our environment to be social. A child requires input that is usually gotten from human social contact. He has to have a certain degree of richness, or else he will be impoverished socially and emotionally later on in life.

I want to turn to the next topic: sex roles, sex-typing and identity. There are obvious biological differences that anyone can see in males and females. I think the real significance is principally in the function of the sexual roles in the bedroom sense. There are different forms of social behavior for male and female children, and male and female adults. Those kinds of social roles are learned. Our society treats males and females differently from the time of birth. We can see this in the types of clothing for infants, e.g., pink for the girl; blue for the boy. We see it in the types of toys bought for the infants and children. We see it in the types of behavior encouraged in young children. The question is, who does this? Society in the larger sense is responsible. But it is the woman, in most instances, who rears girls into little ladies who stay at home to rear children, and it is the woman who rears boys to grow up to be "men."

If these kinds of role preferences were biologically determined, then you'd expect that from a very early age you'd get girls going to girl's things, and boys going to boy's things. Studies of sex-role preference and identity indicate that at kindergarten age, girls are equally oriented in their preference for masculine and feminine activities. From age six to nine or ten, girls begin to show male preferences in the kinds of roles they select. About age nine or ten, they want to do all the girl's things again.

If there were some fundamental biological differences for roles, we'd expect in all human society that the roles would fall one way. Girls would be cut out for one role; boys for another. In the majority of human societies, the business of commerce, travel and war goes to the males. The females have the responsibilities for caretaking in less complex things, such as agriculture and so on. In a number of societies, however, the roles are equally divided. In other societies, the women do the business of travel, commerce and war, and the men stay home and take care of the children and agriculture, and so on. This would not happen if males and females differed in their intended roles biologically. It is the social training that young children receive and the roles they are pushed into that matter.

The next topic is assertiveness and aggression. It has been suggested that males are more aggressive than females, implying that a biological difference accounts for this behavior. One study of three, four and five year old children was conducted by placing the children with a plastic doll. The children were left alone and an attempt was made to determine the frequency with which the children hit, kicked or threw the doll in the air. My research, as well as research of other investigators, has shown that males produce more kinds of responses we call aggressive than do females in this situation.

Consider another study, though. Children were put into a situation where they were told that there was another child in another room. If the child wanted to help the other child, he had to push a button. If he wanted to hurt -- to aggress against the other child in the other room -- he pushed a second button. In this circumstance (of willingness to aggress without actually aggressing), girls were as aggressive as boys. The willingness to aggress exists for both genders. What is the difference is the active social training they receive.

There are certain circumstances that will produce assertiveness and aggressiveness: if your goal or path is being blocked; if somebody has deprived you of your rights, your property or opportunities that are yours; if someone provides some sort of insult or injury to you. Presented with any of these frustrations, a child can withdraw, he can assert himself or he can do physical harm to another individual. Assertiveness is a kind of positive, valuable aggression. Children are instructed that they be able to stand up for their rights. There are negative aspects of aggression resulting in physical harm. Through the provision of reward and punishment for certain kinds of aggression, a pattern of aggression can develop that is not wanted.

Consider a series of studies conducted by Richard Walters. He used boys as his subjects. I believe that exactly the same results would have been obtained using girls as subjects. I base this on my faith in the similarity of the two sexes. The boys played with a plastic toy clown. An adult rewarded the boys or provided approval for their aggression against the clown. Days later when the boys were brought together to play, a frequency of aggression against each other was obtained. Boys who were rewarded with aggression against a toy, generalized and aggressed against other kids. Boys who were not rewarded for aggression, did not aggress as frequently when brought together with other boys. In some conditions, the father surrogate approved only when the child hit the doll clown very hard; these boys were the ones who hit other children hardest. Encouraging a lad to be a real boy through his play activities tends to build a habit of that kind of aggressive behavior in situations where you would not want, or hope, or expect it to generalize. It does happen in many instances. It is appropriate to train children to be able and willing to act in a forceful way if needed, but it seems to me that it should be taught as the last option, not the first.

Participant

How about aggression and violence on television? Does this affect behavior in our children?

Dr. Liebert

This is exactly what does happen. There is no question that the observation of live others -- your peers and your parents as they act in daily life -- exercises enormous effect on the development of social and emotional behavior. Watching television violence instigates physical aggressive behavior on the part of children. When you see violence and violent actions on the part of others, it instigates violent actions on the part of observers in two ways. First, by teaching them how to agress, the actual "how to do it." Second, it tells you that many people act this way and they are highly successful. It's a way of getting what you want. It is reasonable to call it the modeling hypothesis because you have models for examples of aggressive behavior.

Another explanation for viewing aggression is called the catharsis hypothesis. When you need to aggress, that need has to be drained off in some way. You drain it off by an actual physical act, or you can drain it off by watching television.

Research collected between the late 1940's through 1960 never supported the catharsis explanation. The research repeatedly suggested that seeing aggression made children more aggressive. In the 1960's, a million dollars of research was conducted by independent investigators to determine the effects of aggression on children. Thousands of children everywhere in the United States who watched real television programs were used. The results indicated, irrespective of the way the data were analyzed, that the more television violence the child watched, the more aggressive the child was both in attitude and behavior. The evidence is nothing short of overwhelming that television violence is one cause of aggressive behavior.

I want to talk about self-control, cooperation and sharing. A general principle is that children learn a great deal from the consequences of rewards and punishments their parents provide them. Children sometimes are also affected by the direct insturction their parents provide. For example, "It's very nice to share with other children." This kind of statement is a frequent way in which we try to communicate, to socialize, and to develop our young. Children have an opportunity of seeing their parents in situations in which the parents do not follow the instructions they give their children. A common practice in child rearing is: "Do as I say, not as I do." What is the effect of inconsistency of word and deed?

We had set up an experiment in which children were exposed to a number of situations. One situation consisted of adults abiding by the rules and urging children to abide by the rules as well. A second group of adults instructed children to abide by the rules, but in the children's presence the adults broke the rules. When the adults were present, the children followed the rules closely, whether the adult followed the rule or not. The second phase was concerned with children's actions when the adult was not present. A "new" child who had not heard any of the rules or seen the adult was brought into the situation. Children who had an adult urge them to stick by the stringent rules that the adult broke, now broke the rule when the adult left the room and also transmitted the idea that it's okay to break the rules to the new child. In sharp contrast, when an adult presented a rule and adhered to the rule, the child uniformly stuck to the rule and transmitted the rule to the new child.

In other experiments, three groups were used: The adult indicates a rule and breaks it; the adult presents the rule and there is no opportunity to learn whether the adult follows the rule or not; the adult indicates a rule and keeps it. The research showed: You kill the rule when the adult is gone, if the adult states and breaks it; you're in the middle if the adult states it and gives you no opportunity to find out whether or not he follows; if the adult gave some evidence of sticking to the rule, the child adhered to it whether or not the adult was around.

We did another experiment concerned about children's willingness to share with others. In one group, children were urged to share with other children. In another group, the children saw an adult share with someone else. Half of the children were then placed in a situation where they could share themselves, with the adult present. The other half had no adult present. The "do-gooder" speech was more effective when the adult was present and could note whether the child followed the preaching or not. When the child was alone, the adult example carried over and the child shared with other children. The do-gooder speech fell apart in this instance, and had little effect. We can conclude that examples for children not only affect present behavior, they also build for the future.

Participant

I'd like to deal with the teacher as a model in the classroom, and the effect that the sex of the teacher has on what children learn. This would have implications for handicapped children. Usually, handicapped children are more dependent upon their mothers than normal children.

Dr. Liebert

I think the question of the female teacher as a role model for both female and male children is closely knit with the socialization pattern in our daily lives. I think the female teacher is a less effective model for males and more effective model for females, in certain classes of behavior.

We are teaching our children in the first six years of life that there are three kinds of behavior. There are boy behaviors, girl behaviors and neuter behaviors. For the neuter behavior, activities that are not sex-typed, the teacher can communicate them in words and deeds to males as well as to females. For the male behavior, the female teacher would be a poor transmitter for boys. For female behavior, she's going to be more effective. Society, however, is making the definition as to which behavior falls into the three classes. We've got so many things classified as boy or girl, it really hampers the instructional process. If boys do one thing, and girls do another in many different domains of life, then the neuter class is getting small. And it is the neuter behavior where the sex of the teachers matters the least. Research shows that children are going to be sex-typed in their imitations. Boys are going to imitate males, and girls are going to imitate females, with much less cross-sex imitation. One reason for that is a motivational one. We teach children that it's appropriate to copy only those things that are gender appropriate for the child.

Joan Grusec has shown that another mechanism for this is the learning itself. By the time the child reaches ages seven or eight, the child is attending more closely to the actions of the same sex than of the opposite sex models. One of the reasons boys don't learn how and do not imitate female teachers is that they are simply watching them less closely than they watch males. They really are selectively inattentive. The problem is, how are you going to change the orientation of the children so that they will attend to the individual in front of the classroom, whoever it may be.

A broad generalization is that the child is a translator of the information from the teacher. The learning process by the child is a translating one, and the translating mechanisms that we have given to male and female children from very early in life are different. The output is going to be different in terms of what they end up learning, and to the degree it is effective for males and for females.

Statements are usually made that girls do better in verbal tasks, and boys are better in math. In England, however, you don't find this great disparity in math and verbal aptitudes between boys and girls. It proves that boys are not neurally programmed to be mathematicians, and girls are not programmed to be writers of novels. In junior and high school, most of the English teachers are female, and most of the math teachers are male. It may be the reason why males in this society are more apt at math, and females more apt at verbal skills. It may have to do with the individual selected to instruct the subjects. If we had any sense, verbal and mathematical skills would be neuter behavior. If our society is conspiring to make them sex-typed behaviors, it's conspiring to make a difference in the overall product of education.

Participant

Did you say that through kindergarten girls and boys selected toys and activities without a sexual preference? I found that whenever children came into kindergarten, girls almost always ignored blocks and woodworking and went into the housekeeping corner. Boys almost always went to the woodworking and blocks.

Dr. Liebert

We're both right. I would distinguish between sexual preference and sexual behavior. From the time children are very young, we push girls and boys to behave in different ways: We push boys to pick up hammers, and girls to pick up a kitchen spoon. What we do see in the classroom is what they do, which is different from what they prefer to do.

Participant

I would like bring up the question of children not responding positively to other children because they don't know the proper way.

Dr. Liebert

One of the principal causes of incompetence or lack of social behavior on the part of children is now being deemed to be a lack of the appropriate competence -- not knowing what to do. We're moving away from psychological disturbance as an explanation of unusual behavior, or the absence of normal behavior. Lack of competence is becoming the explanation. A child simply doesn't know how to relate and to interact with other kids. We spend remarkably little time with most children in directly teaching them how to interact with others. We criticize them by verbal rebuke and correct them when the interaction is inappropriate, or when there is no reaction. Probably the reason that we do spend little time teaching children how to interact is because we have seen in our own experience the majority of children don't seem to need it. They learn from observing their older peers, siblings and adults. With a minority of children, the learning process doesn't happen with seeing what others do. The solution becomes a direct provision of information as to how to engage in these types of social behavior.

A researcher by the name of Irvin Staub found that in the course of testing a large number of preschool children, there was a disappointing lack of cooperation and helpfulness. He tried two different training procedures to induce increased amounts of cooperation in children. One was called role playing, and the other was induction. Induction was a process in which the child was asked to consider the conditions and feelings of someone who was in need of help and was dejected. Staub found that the induction process didn't work well. The role playing training procedure was asking children to put themselves in a situation in which another child needed help and specify how they could be of help to another child. The children then discussed alternate ways of rendering help, and they were asked to get practice in those helpful and cooperative behaviors. At a later time, the children were placed in the same situation as those children who were taught by the induction method. The presocial behaviors rose.

Very often people have reported that they're cold, distant, unfriendly, and the implication is they're not very nice. If you get them in a candid mood, many people will say that they don't know how, and don't feel comfortable when obligated to act in a forward manner. A critical component is that much of the knowledge of how to interact is specific to different social situations. You can be socially competent in one area and extremely awkward in another. We are resistent to seeing people that way. We'd much rather have the broad label of extroverted, introverted, cooperative, hones, and so on. We don't get down to the specific ways in which people respond in one way or another.

I want to describe to you what Robert O'Connor of the University of Illinois did with social isolates in a preschool situation. These were children who were not interacting with any of the other children. O'Connor was highly influenced by the modeling process. He went into a nursery school and identified four year olds who were considered isolates on the basis of the number of interactions with other children during a base-line period. He used an 18 minute film he made. The film showed children who were initially isolated and not engaged in any kind of social interaction. O'Connor displayed, in carefully portrayed and concrete detail, exactly how to go about interacting. He systematically presented what would probably be the sequence of events: teaching what to do, giving the reasonable outcome of events, and giving expectations of what the interplay would be.

He divided the children identified as isolates into two groups. One half of the children were shown the movie as a television format. The other half of the isolates were not shown the film and was the control group.

A third group, normal interacting children, was used for comparison. The children were observed during the remainder of the school year, and the frequency of interactions were recorded. The children who watched the film once, went up dramatically in the frequency of interaction with other children. They now were at a level with the normal, third group of children. For some children, the film that O'Connor showed would not be sufficient, but for many children the therapeutic intervention of the film was enormously effective. This kind of intervention for almost all children, whether they are handicapped or not, becomes a powerful adjunctive technique in the therapy for social isolates.

Therapeutic modeling films can be effective if the proper models are chosen and the film is properly made. They can fairly quickly modify behavior of children, and can rapidly reduce inappropriate or unreasonable fears. There is a great deal of evidence to prove this. What you need as a model in such films is to start with an incompetent in a specific area. For example, if you're interested in fear, you start with an individual who is fearful. If you're interested in social incompetence and isolation, start with a socially incompetent and isolated model. This same incompetent model must end up functioning competently as an end point in the film. Moreover, you need to display the process of change in a detailed, realistic and an accurate way. The changes portrayed should be both the overt behavior and private behavior. The process of change needs to be shown in discrete steps that are small enough and efficient enough to be learned. The storyline of the film depicts the change of an initially incompetent person who, by the process of imitating a competent individual, becomes competent. In other words, what you're saying in the film is that a person like you, starting in your spot, can become the kind of person I think you want to be. The research quite clearly shows that multiple modeling is more potent than the presentation of a single model. Beyond that, you want to show that these actions earn positive consequences. It is clear that much learning of children with difficulties is going to take place through the goals of positive outcome. It is equally clear to me that if you try to rely exclusively on the external provision of consequences, the accusation of "bribery" becomes a compelling one. You will need to display positive outcomes that are intrinsic to the performance of the act. In our films, there is a portrayal of positive external consequences from the environment, and explicit portrayal of the feelings of satisfaction on the part of the performer that is intrinsic to the performance of these desirable acts. The thoughts that we believe are in the child's head are explicitly produced in narrative words. There is a great deal of evidence that shows children are capable of comprehending, appreciating and emulating these kinds of emotional or affective reactions, and they do know what they mean.

In relation to this understanding is research done by Paul Ekman and his associates. They were interested in studying the ability to understand facial expressions by children and adults. Ekman's research involved taking photographs of different facial expressions and showing them to children around the world. Ekman found that emotional reactions in the human face and the understanding of what they mean are quite universal. The implication is that a child will understand someone's facial expression even if what has been communicated in words is in contradiction to the expression. Whatever handicap children have, or we ascribe to them, children are going to be highly successful in reading and understanding your face. When you verbalize one thing to the child and tell him by your facial expression that you feel differently about it, the child will pick it up.

Participant

Are there any films or television programs that would prepare a child for entering school? I'm talking about school phobic preschoolers.

Dr. Liebert

Probably very few. I can't think of any entertainment programs or systematic messages toward the preparation of the first entry into school in terms of social and emotional behavior. There was, however, a very careful observational study of children who were entering the first grade. They were called school phobic because of their unwillingness to come to, or to remain in, school. The dramatic outcome of the study was the reciprocity of the attachment bond between mother and child. The investigators concluded that the mother was the school phobic individual and not the child. In a sense, the mother was afraid that she would no longer be the child's primary attachment.

At home, the child receives cognitive preparation for what school is going to be like: What is to be expected in terms of the situation; the behavior of teachers; the responsibilities the child will find upon entering school. There is also the emotional preparation. The mother or father can lay bonds that are hurtful to break, e.g., you are going to lose mommie, or mommie is going to lose you. The preparation may be appropriate; or it may be absent, causing a deficiency. Or it may be inappropriate and therefore lead the child down the wrong path. The questions we have to ask are what types of preparation in these two domains has the child received.

Participant

We have found that staggering is one of the best ways of separation for the child.

Dr. Liebert

Very definitely. Let me describe the approach taken by the behavior modification psychologists. A very phobic child is brought to school and looks around for a few minutes before the other children arrive. A regimen of treatment is laid out ahead of time. It is a gradual increment of the amount of school exposure. The child wants the treatment to take as long as possible because the child is afraid of school and doesn't want to become involved too fast. Teachers, principals and the parents want the treatment to be as short as possible. You have a fundamental conflict of interest between the two classes of participants. The regimen is a way of dealing with this conflict. If you attempt to try to renegotiate the regimen which has been indicated to the child during the process of introducing the frightened child to school, you lose the invested trust. In a very dramatic way, children of all kinds of background have been taught to overcome their fear by gradualness.

Participant

Is there research we might talk about in terms of different kinds of motivations of children? Maslow makes a distinction between growth motivated children and deficiency motivated children. The concept of deficiency motivated children is relevant to school phobia. Such a child can't get involved in something when he comes in school because he doesn't trust the environment enough to look at anything. He's too involved in grabbing his mother's hand and holding on to dear life. He doesn't trust her, he doesn't trust you, and he doesn't trust the environment. He doesn't dare go near unless he can hold onto his mother with one hand. As soon as he crosses the door, you have the conflict situation being created.

Dr. Liebert

There is pertinent research, but not directly related to Maslow's approach. The Coleman report makes a distinction between internal and external controls. Internal control is where things you have produced are responsible for the consequences and outcomes you get. An example would be: I got a good grade on a test because I worked hard, or I failed the test because I didn't study. External control is when an individual blames fate kinds of things in the environment for the outcomes he gets. An example would be: I failed the test because I was unlucky, or I passed the test because I was lucky. Ascribing responsibility to self or outside forces doesn't hold up as a common personality trait across all areas of behavior. For example, the child may feel that he was doing badly in school because he was unlucky, or that the teacher gave funny kinds of tests. The reason for success in baseball, however, is that he practiced every afternoon. Coleman's report indicates that people who accept the responsibility for their own actions receive good grades and tend to do better.

Participant

Teachers should be using encouragement and praise as a way of motivating children.

Dr. Liebert

There is a good amount of correlational research to suggest that within a domain, when you provide reward for good performance, and encouragement for performance that is less than good, it tends to produce internal control and perserverance. When you provide negative consequences, such as punishment or criticism for poor performance and no consequences for good behavior, you tend to produce external control. More perserverance will be created by reward and encouragement, whether the agent is the parent, teacher or other socializing agent. The principle applies to handicapped or nonhandicapped children in the classroom.

Participant

Is there any research about the effect of reward or positive reinforcement for a child's performance when the performance doesn't warrant it?

Dr. Liebert

Good reward and good feedback would be a mistake to give if the child's behavior doesn't warrant it. Positive reward ought to be tailored to what has been done correctly and ought to identify what is being approved. If a child gives a wrong answer, and you call it a right answer, he can virtually always discriminate that. You lose credibility. You haven't done anything good, but you probably have done something bad in terms of the future relationship and the impact on the child. Instead of giving rewards and approval falsely, begin by giving it inexpensively, but truly.

Positive feedback, the reward, the approval, must always have the characteristic of being the communication, "You did what I wanted you to do, or what I expected you to do, or what was appropriate for you to do in this situation." That's fundamental. If you need a guideline whenever you break that rule, then that's a sure acid test that you've failed. Sometimes, even if the accomplishment is very small, if the statement "Yes, you did what I hoped what you would then do" is a true one; that's also an acid test that would be appropriate to provide the reward.

Participant

You are using the word reward in more ways than the teacher usually uses it. Reinforcement, in the sense you are using it, can be a reflection. It can be a simple statement of what has happened. When a teacher hears the word reward, however, it is associated with praise.

Dr. Liebert

Reinforcement means to strengthen. The outcome and the information we try to provide the child will strengthen what we want strengthened. It will not strengthen things that we would just as soon leave as they are, or fade away. It is in this way that these statements to children are highly informational. Take a situation where a handicapped child is being taught to make a bed and he succeeds. You would want to say to the child in a praising way, "Ha, you just made the bed." You do it because you want to strengthen the accomplishment. You would like the child again to be able to turn up the cover in a similar situation of, "Let's make the bed." In teaching this child to make the bed, you would start with simple tasks, increasing them in difficulty in degrees with praise given at each step. These statements provide discriminative information. They are the pedagogy of improvement. I think it increases the degree of support which you are providing in an instructional capacity.

Participant

Children are exposed to incorrect information from the environment. When we were training a group of volunteers to work with kindergarten children, we found most of them praising the children on how beautiful the work was, even if it wasn't beautiful. It may be volunteers, it may be teachers who think that the way to make a child feel good about himself is to say that the child is doing beautifully.

Dr. Liebert

Auxillary personnel are fine, but educators waste this potential resource. You can make better use of auxillary personnel if you are willing to sell modeling to the hilt. You must insist that they watch you act in the role you intend for them for a period of time. This is step one. It is an observational one. You are protecting them from mistakes, protecting the children and protecting yourself. Step two, permit them an opportunity to work with a child for a minute while you observe them. If any correction is required, it will be a small one, since you have structured the situation in such a way that the errors will be only small ones. The feedback you give them ought to be clear and informative. This kind of training will increase the efficiency of what you get.

Participant

Could we discuss children who are in wheelchairs? It seems to me such children present some rather universal problems. A child in a wheelchair kind of epitomizes some of the problems we've been talking about: the question of dependence, independence, self-concept, opportunitites to get things and experience things first hand, and so on.

Dr. Liebert

Let's focus on that kind of child. There are going to be some similarities and some differences with other kinds of handicapped children. I know, and you must know, adults in wheelchairs who are very successful in life and pursue many activities that nonhandicapped people pursue. With others, it is not the case. The dramatic differences can be attributed to the way in which the youngsters are dealt with from birth, or the time of the handicap's onset. This critical period and the importance of early kinds of emotional and social behavior during the first couple years of life, or the period in which this kind of handicap first appears, is absolutely vital. It is near certain you're not going to be able to get them really going later on, although there will be gradations of success of various kinds. We can say the first five years must be maximized in terms of building an adequate social adjustment.

Participant

How does the parents' acceptance affect the child's adjustment to the handicap?

Dr. Liebert

If the parents accept the handicapped child, it doesn't guarantee a positive social and emotional adjustment of the child. Sometimes when parents don't accept their handicapped child, the child will turn out pretty well anyhow. If there is any significant amount of parental rejection, however, you're not going to have a reasonably well adjusted individual.

There are different kinds of parental acceptance of a child in a wheelchair. One is a form of martydom. The child is shown superconcern, supercare, superattention, and what is created is superdependency. The second form of acceptance has to be communicated and transmitted to the child at the very beginning, in actions as well as in words. Handicapped individuals need to accept their physical condition. At the same time, they must not accept the idea that any kinds of social, professional, occupational activities will be closed to them. That is the message that has been transmitted to the most successful persons who are in a wheelchair.

Participant

What is the relationship between age and the adjustment to the condition?

Dr. Liebert

I suspect for some individuals, a later age of onset of being in a wheelchair will seem to be an advantage. They will have had the experience of walking and all other activities. They will have had some social relations and education. They will be able to capitalize on the past. On the other hand, I suspect there are individuals for whom it would be a disandvantage because the profundity of experience of the loss is much greater. The critical period for someone who is going to be in a wheelchair is the time in which recognition of the difference that exists between you and others.

This is the period where you make or break the adjustment mark.

Participant

In a way, that's the emotional dilemma for all people we categorize as handicapped; mainly, how to come to terms with being different. The irony, I think in terms of socialization, is that unless the parent is also handicapped, that we provide an adequate role model for the child.

Participant

One of the reasons we are putting children back into the mainstream is to provide models for them. If there is too much discrepancy between the child and other children, I feel very little learning is going to take place.

Dr. Liebert

If handicapped children are not going to learn social behavior from normal children, and normal children may find the handicapped as incompetent, you will have to manufacture models. You can do this by making a film analogous in its psychological components to the ones we mentioned before. You can start with an incompetent handicapped child and show through play-acting how the incompetent achieves a high degree of competence. You can also introduce live models of children with handicaps who have achieved high degrees of competencies into the learning situation. They can demonstrate by their actions and explain how they have achieved this competency.

Participant

How much is too much of a discrepancy between the model and the child who is handicapped?

Dr. Liebert

No discrepancy is too great, provided that the initial stage of the model clearly comes across as being no better than the initial stage of the observer. Also, the model must communicate that he was no better than the observer is, and that he didn't have any special advantages in the transition process. That is a way to set high aspirations and cause them to be accepted.

Participant

If you're going to put the handicapped child into the mainstream of education, the education has to go two ways.

Dr. Liebert

That is true. There are many circumstances in which certain kinds of physical handicaps become a basis for quick acceptance by normal children. There are some circumstances for almost a favorable bias. Whether that happens or not depends upon what the child in the wheelchair has been broadcasting and broadcasts from the first time he shows up. A child shows up and broadcasts the following: It is not going to embarrass you; it is not going to embarrass me; I have things to offer and we can interact. That kind of child will not be avoided by the others.

Participant

But there are children who can't broadcast that way. When do you send such a handicapped child into a group situation?

Dr. Liebert

I don't think that there is an easy solution. If you have had past experiences of bringing in handicapped children into normal situations, you know the kinds of things that can occur. You can then role play and make some determination of both the child's ability to broadcast and the child's resiliency if some of the more negative things come along. You can sort of simulate kinds of situations that you think might arise. In clinical work with children, you introduce new skills in an artificial environment and then decide when you are ready to introduce them to the natural environment.

Participant

I think one of the reasons handicapped children do get rejected by others, in many instances, is because they don't look like boys and girls. They look neuter. In residential centers, it is easier to let them wear the same clothes and give them short haircuts. I can remember working with an emotionally disturbed girl who was rejected by all of the other kids. They picked on her boy's haircut. That certainly wasn't the most important characteristic, but that was the one they focused on.

Dr. Liebert

I would agree that gender restoration probably does a great deal of therapeutic good.

Participant

I think independence, which is a real problem for almost all handicapped children, and assertiveness can be taught. Many children receive approval from parents and teachers only when they are passive and being good children. People look at severely handicapped children and say they are well-adjusted. They usually refer to such awful things as the following: never raising their voices; never saying anything negative; always doing what people want them to do; never seeming to resent their handicap; and other things which are not desirable.

Dr. Liebert

In what kinds of ways is a handicapped child in a learning situation exposed to competition with his or her peers? Are conflicts minimized by the teacher of handicapped children?

Participant

I think a problem we can focus on is how to help handicapped children become assertive in ways that will not get them rejected by peers and normal adults.

Participant

In specific ways, how can you role play, how can you use modeling to help the handicapped child become more assertive?

Dr. Liebert

In order to teach by modeling, you have to have situations in which those kinds of skills and feelings can reasonably emerge. Assertiveness is a way to defend oneself, one's property, one's interests in primarily a verbal way. Real assertiveness is a very sophisticated way of dealing with others. In order to teach it, you need situations that potentially provoke that kind of behavior. If there is one ball and two children, that is an excellent opportunity for them to learn how to be assertive. A teacher who brings in a second ball to take care of the problem is taking away the opportunity for these children to learn how to cope with anger, and the opportunity to learn how to be assertive.

Participant

Most people who come through the child development funnel, have a tendency to reduce conflicts and to make everything sweetness and light at the preschool level. There is the tendency to calm things down by saying to the child, "Wait for your turn with the ball."

Dr. Liebert

Are you telling me that there is a very active suppression when dealing with handicapped children? Are teachers very strongly pressured not to show anger?

Participant

I'd like to give an example that illustrates this point very well. Henry LaScarby is a congenital amputee of one leg. He started Ability Incorporated which is a profit making business for severely handicapped adults who have not been able to find employment in other competitive industries. It makes money and competes on the regular open market and employs severely handicapped adults.

When Henry was a child, he was quite aware that he was getting preferential treatment. He described a day in school when he dropped marbles for an unbelievably long time. Finally, the teacher lost her temper and yelled at him. She gave him the same punishment that she had give other children. He said the relief was fantastic. He had at last joined the human race. People hold themselves back from responding, and I believe we do it to a stronger degree at early age levels where it is more important to give children realistic feedback.

Dr. Liebert

Don't be too quick to think that somebody is going to immediately want to give up all that preferential treatment. Sometimes you will find that the handicapped child will be relieved when you start acting like a regular person toward him or her. Other children, however, are going to give you a negative reaction. The child may turn manipulative on you. That may mean you have tried to have him give up some of that special treatment.

Participant

How effective are verbal techniques with young children in comparison to role playing?

Dr. Liebert

Verbal instruction without any kind of supplement seems to have relatively little effect. I'm talking about social-emotional areas. Verbal instruction that is contradicted by an example is a complete failure. Verbal instruction, however, can add to an example that dovetails with it. If I share in a situation, the effect of my example will be for the child to share as well. At least that's the tendency for the effect to go. If, however, that's supplemented with some sort of verbalization that's consistent with it, that tends to elaborate for the child the nature of the act that I performed, and reason why I performed it. It defines circumstances for the child where this action may be appropriate.

But what I really think you're leading to is the need to reflect on the training of teachers. That's what all these examples and situations indicate. There are two things in this area. How do you select a potentially good candidate? What kind of training are you going to provide?

Participant

In a school situation where there is an immediate problem with a teacher, how is it possible for you to attempt to help the teacher change his or her behavior?

Dr. Liebert

You can use role playing. You can use modeling as a training procedure. Seeing a movie, sitting right there in the classroom and observing a model sometimes works. But if the teacher is trained in a more dynamic kind of interaction role as observer, the training is increased. For example: I show you; you copy in my presence. I give you feedback as to how faithful the copy was. I show again; you try again. I give you feedback as whether or not you're producing closer approximation.

Participant

If a teacher is in charge of a class and is having a problem in one area, you can deal with it by role playing or some other method. When she is having problems in all areas, however, you can't deal with everything. I think it would be realistic to take her out of the classroom at that point. If she were a student teacher, you might still be able to help her.

Dr. Liebert

It's a matter of starting training early. You can use modeling by having future teachers observe teachers whom you feel are good. In some sort of internship, you can give feedback on whether they have learned from observing. You can indicate whether they are emulating the model correctly.

Participant

The problem is you really have a horrible time finding the right models. The whole area of social-emotional modeling is even more tricky.

Participant

What about the negative model?

Dr. Liebert

Research is unambiguous that the impact is a bad one. When you present a bad example, the observer seems to carry away the lesson you were trying to convey. With the passage of time, however, there is a tendency to separate the evaluation and behavior displayed. Ironically, people may come to display the very negative behaviors you showed as bad examples. An example of this is that frequently you hear adolescents talking about the failings of their parents as they see them. Yet, when they take the role of parent, they start doing some of the very same things they criticized.

Participant

Why not start off with air-tight models. Take a videotape of a really superb teacher performing. Have trainees look at these tapes before they go into the classroom.

Participant

That violates another principle in terms of perceived similarity. A young girl may not really identify with a master teacher. If she does, the difference in competency is such that when she gets into the classroom and tries, the whole thing falls apart and she rejects the model. I want to go back to your example about films in which you show someone who starts out incompetent and moves to competency.

Dr. Liebert

I think you're exactly right. If you present the full-blown, highly competent teacher, it's not going to work because of the great disparity between the teacher and the observer at the beginning of the training period. If you were to do that, you would be violating the "small dosage principle." And that's the very best principle we've got. It's involved in the shaping. It's involved in the modeling films, and so on. Now, when we were talking about incompetent conditions in childhood fears, this was the basis for establishing an identification between the observer and the model. But for the beginning teacher, you don't need anybody who displays incompetence. You need a model of a beginning teacher on that videotape.

There are traditional things you can do with videotape. You can stop a videotape or movie projector at points other than when the whole film is over. Here's an example. We have a child who hasn't learned something, or a child who is acting out, or the teacher who is faced with a problem. After initial teaching training, stop the videotape before the teacher in the film has made her decision. Now you can have your learner indicate what he or she would do. The feedback is already there. It is a matter of deciding when you are going to flick the switch on. If you use videotape, you can fade out a section and insert words in: "What would you do?" You don't have to turn the film off. You can just leave a ten second blank.

Participant

I want to extend the negative model idea and relate it to a kind of self analysis. When student teachers are videotaped, they study the tapes of their own behavior. They see things they've done that you don't want them to repeat. How do you avoid presenting them with a negative model, and yet permit them to analyze what they are doing?

Dr. Liebert

First of all, I would not show them videotapes of themselves. I think you need to communicate the error they are making by presenting them with a positive model and repeating the presentation of that positive model. The verbal communication ought to be, "The last time was pretty good," or, "The last time there were some problems. Let's try again. Let's break it down into smaller steps. Let me show you the film again." The information you communicate ought to be couched in the display or the redisplay of doing it right, not in the redisplay of what they are doing wrong.

Participant

Are you saying not to deal with that kind of raw situation?

Dr. Liebert

No. I have no objection to videotape per se. The only reason you might want to use a videotape would be to point out the good behavior. You communicate the problems that the teacher has, but you point out the good features. This way, you avoid stamping in any of the wrong stuff. You're communicating that there was something wrong, but you're laying the alternative in as fast as you can.

This is analogous to dealing with wrong answers. When a teacher asks a question and gets the wrong answer, she should immediately provide the correct answer and ask the question again. Then she should confirm the correct answer given by the child. This is the prototypic system for dealing with wrong answers.

Participant

A lot of teachers of young children are encouraged to be dramatic. It is common to say you have to be a good performer to be a good teacher. Often, teachers use role playing to dramatize a child's mistake. Are you saying they should role play the other aspect?

Dr. Liebert

The ability to dramatize can be an effective tool for a teacher, but dramatizing children's mistakes is a bad way of using the technique. It's best to think of the teacher as having strengths and deficiencies, rather than the teacher being a good teacher or a bad teacher. I think that would help find the basis for improving those who overall aren't so sharp. It would also provide the kind of thinking about oneself and other teachers that allows for further improvement in those teachers who are already quite good.

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PERCEPTUAL DEVELOPMENT

Dr. Lila Ghent Braine*

I would like to start off by pointing out some of the topics that I planned to omit, and then outlining briefly the material I planned to cover.

There is a great deal of new data available on perception in infants, but I was not planning to cover this material unless the group expressed an interest in it. The work on speech perception will be omitted since there is a whole workshop on language. Finally, I thought we would leave out many of the traditional areas in perception, such as the constancies of depth, size and shape, color perception and so on. In general, I want to focus on form-perception, and problems relating to it.

I plan to deal with five main topics, of which the first three will be discussed in greater detail. (1) A new judgement of orientation will be described, in which it will be shown that preschool children show remarkable consistency in judging the orientation of geometric shapes; similar judgements are made by children in the U.S., Iran and Zambia. (2) Rotational errors made in the copying of geometric shapes will be analyzed, and it will be pointed out that there are two main sources for such errors -- judgements that certain orientations are upright, and preferences for the order and direction in which the lines of the shape are produced.

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(3) The discrimination of mirror-image shapes will be discussed in terms of how the placement of the figures (side by side or one above the other) influences discrimination of the figures, and in terms of whether the difficulty is due to mirror-image reversals of the shapes. (4) Laterality of function is not limited to speech and hand dominance, and some of the work indicating lateralization of perceptual functions in both adults and children will be described. (5) Work on cross-modal transfer has yielded two main conclusions -- that touch cannot be said to educate vision, and that the extent and nature of cross-modal transfer seems to be a function of the stimulus dimensions common to both modalities.

First, I shall describe a new judgement of shape orientation made by young children. When we say something is upright or upside down, we usually are referring to the orientation of the shape in relation to some external, environmental frame of reference. For example, if adults say that a cup looks upright, we mean that the cup is in its usual position in the world. However, children do not appear to be limited to making a judgement of uprightness that describes the customary position of a shape in a framework. In contrast to older children and adults, preschool children readily judge the orientation of many nonrealistic shapes as upright in one orientation, and upside down in an another orientation. They are as consistant in judgement with these geometric shapes as with realistic figures.

The task runs something like this. Show a child pictures of two realistic figues, e.g. a right-side-up car, and an upside-down car. If you ask a four year old to show you the car that is upside down, the child will point to the correct car. You show a picture of a house, one upside-down, and one right-side-up, the child will point to the correct one.

Then pairs of geometric shapes are introduced, and preschool children will continue to select one member of the pair as upside-down without any hesitation. The surprising thing is that four year olds (as a group) will give consistent judgements of what's upright and what's upside down, even when the children can't identify the shapes.

I tried to find out what it was the children were responding to in making their judgements. So I constructed a lot of figures I thought might give me some clues how the children made their judgements. I originally felt that the judgement might be based on whether or not the figure was closed, but this aspect did not seem relevant. Another possibility was that the children's judgements were based on stability of the figure, that is, the figure was judged to be upright when the heavy part or the base, was at the bottom. However, there were many instances in which the opposite seemed to be the case.

What I then thought the children were responding to is what one would call focal features, or salient features, e.g., the angle: the angle of the V, the point of intersection of the T, the rounded portion of the crescent, and so on. When these focal features are at the bottom, children call the figures upside down. I then made a set of figures based on this notion. I used simple figures, e.g., a dot on a card. I presented the cards in pairs. One dot was at the top, another at the bottom, and the child was asked to point to the card that was upside-down. The consistencies were remarkable. When the focal point was at the top, the child called it upright. Essentially, the children's judgements of uprightness appeared to be determined by two characteristics -- the presence of a focal, or salient feature at the top of the figure, and a vertical orientation of the main lines (or long axis) of the figure.

Antonovsky repeated the same experiments with Iranian children. The responses were very similar to American children. This is particularly important because the Iranian language uses an Arabic script which is very different from the alphabet-shapes to which children from western cultures have been exposed. Very recently, Serpell tested children in Zambia, and found that Zambian children make the same judgements of the upright of geometric shapes as children in the U.S.

It is an interesting phenomenon. But why do children do this sort of thing? Is it just because children have idiosyncratic notions about space, or does it tell us something about how children perceive shape? I would like to argue that it tells us something about how children perceive shape.

Let us assume, first, that form-perception in the young child involves a serial processing of the parts of the form, and that this serial ordering begins with the focal feature. Second, let us assume that there is a tendency to continue processing in a downwards direction. (Serial processing of this sort is considered to be an internal process that does not depend on overt eye-movements.) If the young child processes shapes by starting at the focal feature and continuing in a downwards direction, then a visual pattern can conform to, or be in conflict with, this processing strategy. When a geometric pattern is oriented with the focal feature on top, the orientation of the figure is congruent with the processing strategy proposed, and the child calls the figure upright. On the other hand, when the pattern is oriented with the focal feature at the bottom (or the side), the orientation of the figure conflicts with the internal processing mechanism, and the child calls the figure upside-down. I am suggesting that the child's judgement of the orientation of geometric shapes (that they may never have seen before) is a judgement of whether the pattern is oriented to fit with the child's perceiving mechanisms or to conflict with them. This interpretation implies that recognition should be better when geometric shapes are presented in the upright orientation than in the upside-down orientation, and it has been found that recognition is indeed facilitated in preschool children by presenting geometric shapes in the orientation considered upright by the child.

The judgement the child makes is not something that is learned from adults, because adults don't make the same judgements. The judgement stems from the characteristics of the visual perception system of the child. When adults make a judgement, they say it's upright in respect to a certain frame of reference. I think children make judgements on whether the figure fits with their internal processes mechanisms, or whether it doesn't fit. It is a more primitive judgement. The reason why children often seem to make errors is because they do not use the systems we adults use. The child's system, for example, provides no way of distinguishing between left and right, but it does provide a way of distinguishing between up and down. It is well-known that children can identify upright and upside-down long before they can identify right and left.

Participant

I just want to see if I'm hearing correctly. Are you saying that basically there is almost a set of the perfect chair, the perfect form? That somehow, without thinking through the process, what they see matches that set. They then internalize it as correct, or upright, or comfortable?

Dr. Braine

I've never thought of using that analogy, although I think you have something there. I'm not at this point saying that they have an image of the ideal shape in their minds. Instead, I want to say that shapes are not analyzed as a whole, but are analyzed in terms of their features (component parts), and that there are rules or strategies that the child uses to determine the order in which the features are analyzed. The child then makes a judgement about whether the orientation of the figure fits the strategy of perceiving. Let me tell you a story told to me by a preschool teacher after I had described this work.

The teacher taught at a private nursery school where each child had a folder for their paintings, so that it was not necessary to write the child's name on each painting. At various times, the teacher would bring out new paintings from the folders to replace the ones hanging on the walls. She would always ask the child whose painting it was, how the picture should be hung on the wall. (As I am sure you realize, most of these paintings were not representational, or were not identifiable by most people looking at them.) The teacher was surprised to find that the child always wanted the picture hung in the orientation in which it had been painted. (The teacher could tell because of the almost invisible thumb tack holes used to hold the paper on the easel.) What really astonished the teacher, however, was that many other children in the group could tell the "right" ways to hang the picture. The teacher's observation is not surprising, however, from the point of view that the young child judges the upright in terms of whether the figure fits with the child's perceiving strategy. Although adults tend to find the child's judgement a strange one, perhaps we adults have a remnant of this mechanism that still operates on occasion. Abstract art is usually considered to be upright in a specific orientation, i.e., adults show statistically significant agreement on the upright orientation of non-representational paintings. Perhaps adults make such judgements on the same basis as children make judgements of uprightness.

Participant

You mean if I were to give the same shapes on cards and tell a child to do what he wanted with them, he would consistently put them in the upright?

Dr. Braine

They usually do. Children seem to spontaneously turn pictures to the upright, both realistic ones and geometric ones. One explanation is that kids recognize them better when they are upright, because of the way children analyze the shapes.

I want to make another point that is relevant to this kind of judgement. When I put pictures down flat on the table, children were not as reliable in their judgements. I don't have solid data on this, but I think it's important. You're more likely to get reliable judgements if you hold cards up. You're more likely to get some errors and variability when you put pictures flat. I think this is because top and upright have meaning for the child primarily when the picture is presented in a plane perpendicular to the ground.

Another point is, when something is flat on the table, very young children often consider the near part of it to be the top. This tends to appear in four year olds, but if the task is complicated, you can get it in five year olds. Kugelmass has some data relevant to this problem with Israeli and Bedouin children. Israeli children consider the near part as the top until ages five and six. The Bedouin children keep doing this for a much later period. Kugelmass thinks that the shift for the Israeli children is due to training in reading. At any rate, I think there is a real problem here that has not been worked out yet.

So, if you're going to teach top, I think it is much easier to begin by holding things up. The problem comes in with the transfer of direction when the figure is flat. If one is to teach direction, or a spatial order, one might be better off to work on a blackboard or easel.

Participant

Do you think that the child who has had an unusual early experience would develop differently, e.g., the child who was confined to a bed?

Dr. Braine

I think the relevant experience is holding the head up, which probably occurs even in a child confined to bed. Whenever you put an infant on its stomach, it usually tries pushing up and holding its head up. When an infant begins to crawl, it may be on all fours, but its head is upright in respect to the world. I actually think children get enough of this just through the ordinary course of growing up, even if there are a lot of limitations.

At this point, I would like to move on to a discussion of rotations made by children when copying geometric shapes. There are many situations in which adults present children with geometric shapes to copy, and children sometimes draw the figures in a different orientation from that of the model. Usually, such rotations have been interpreted as errors of space perception, or as evidence that children are unresponsive to orientation. However, this interpretation assumes that, since the shapes are unfamiliar, the orientation in which the figure is presented is perceptually neutral, i.e., neither upright nor disoriented. However, we have already discussed material indicating that this assumption is wrong for young children. I would like to propose that some of the rotations observed in copying are shifts to the apparent upright, and that rotations might not occur if the model were presented in the orientation that appears to be upright to the child.

There is evidence for this position in the work of Carolyn Eldred. She worked with some geometric shapes that children consider upright in one orientation, and upside down in the other. She said if the idea is a valid one, when you give children the upright one to copy they should copy it in the correct orientation and shouldn't make any mistakes. If you give them the upside down one to copy, they ought to make mistakes. The subjects were four and five year old children, a middle class community. One group of children had upright shapes to copy, and another group had upside down ones to copy. When the shape was presented upright, there were virtually no rotations. When the picture was presented upside down, there were quite a few rotations. Clearly, the rotations made by these children were not due to deficits in space perception, but to the presentation of the models to be copied in an orientation that was not upright to the child.

There is evidence for this interpretation in some of the rotations made by children with different kinds of pathology. Some years ago, I examined the drawings provided by the Bender-Gestalt, a widely used diagnostic test which presents the child with a series of geometric shapes to be copied. Records showing 90° rotations (rotations to the vertical) were selected for analysis; left-right rotations were disregarded because they could not be rotations to the upright. The question asked of the records (made available through a local clinic) was whether the 90° rotations were shifts to a specific orientation -- the presumed upright -- or whether the shifts occurred equally often to the two possible 90° rotations. (The analysis was limited to two figures, since only these figures had one end which could be considered focal.) In virtually all the cases, the rotations were in the predicted direction.

At the same clinic, we then had the opportunity to work with a small group of schizophrenic and brain-injured children, to whom we presented geometric shapes for copying. We presented the figures in two ways: upright half the time, and upside-down half the time. Again, the prediction was that the children would rotate the shapes only when they were presented upside-down, and indeed, the rotations were made only for the non-upright shapes.

Some of the qualitative observations support the general point of view being presented. Two children turned one or more of the horizontally presented shapes so that the focal feature was at the top before beginning to draw; both children volunteered that the figure looked better when turned. The figures were turned back, and one child copied the figure by turning his body around so that the figure and his drawing of it were vertical with respect to his head. Another child pondered when presented with the first non-upright figure to copy; he drew the figure in the upright orientation and then turned his drawing so that his copy was oriented the same way as the figure presented. This behavior is particularly instructive, since it suggests that the child had no difficulty in perceiving the spatial relations correctly, but found it difficult to draw a figure that was not in the upright orientation. Now the question arises as to why a child might find it difficult to *copy* a figure that is not upright.

I want to suggest that when we copy something, we really do not copy the object out there -- we copy from an image that is in our heads. That is, we look at a visual pattern, and then construct an internal representation of it. In addition, I want to propose that the internal representation is always in the upright orientation, regardless of how the pattern is actually presented, although the person would also store the information that in any particular instance, the figure is upright, sideways, or upside-down. If the figure presented for copying and its internal representation are not in the same orientation, then a child might have difficulty in reproducing the figure in the orientation presented. Lines that were vertical in the internal representation would have to be translated into horizontal lines (for a figure presented in the sideways orientation), curved lines in one direction would have to be translated into lines curving in another direction, a feature at the top might have to be placed at the bottom, and so on. Essentially, this interpretation implies that fewer processes are involved in copying an upside-down figure in the upright orientation, than in copying the upside-down figure in the upside-down orientation.

Thus far I have talked about one important source of rotational errors in children's drawings -- the child's perception of the upright. Another source of errors has to do with the rules and sequence of motions that the child uses in copying the shape, and here we can account for at least some of the left-right errors commonly observed. Some of the recent work in this area has been done by Goodnow and her colleagues. They started from some old work by Ilg and Ames, who noted the order in which children of different ages made the lines used in reproducing a shape. If you watch the sequence of motions or the sequence of lines, one can make some inferences about what the child is doing, which is often impossible to do when looking only at the finished product.

Goodnow gave children a variety of geometric shapes to reproduce, such as squares, triangles, and so forth. By observing, she ended up with a few rules which seemed to govern how the child reproduces the shape. The first rule is, you start at the top. Second one is, start at the left and move to the right. If there is an apex, go down the left side first. Another one is, if possible, start with the vertical first. If you draw verticals, you draw from top to bottom. If you draw horizontals, you draw from left to right. Around 5 or 6 years of age, children tend to follow a contour with a continuous line, which Goodnow calls "threading."

Some of the left-right errors in copying letters appear to be due to following these production strategies. There is evidence that if you give children /d's/ and /b's/ to copy, they will more often get the /b's/ right. This is understandable if one considers the child's production rules. The child starts with a vertical, starts at the left and moves to the right. This strategy would tend to produce /b's/ more easily than /d's/. Similarly, I recall a child having great difficulty making a capital /J/. He started with the vertical and then always moved to the left, which produced a reversed letter. The reversed capital /N's/ frequently made by children is due to the rule of starting with the vertical, starting at the top and the left, and then "treading."

If one could get an understanding of what the child is doing, what the strategies or rules are they are following, then one could intervene more sensibly. One would be able to communicate with the child better, because one would be speaking the child's language.

Goodnow has also observed children drawing realistic figures. She wanted to understand the rotation of drawings of people. I think this is a combination of perceptual and motor rules. Children first draw a circle. They then put in the eyes. Then they put in the mouth, or the nose. Then they draw a body with arms and legs. Or, they may just put in the head, eyes on the body, and the arms and legs. They almost always start off with the head and the eyes and take it from there.

Goodnow continued a step further and positioned eyes on various parts of the page, and asked children to complete the figure. Preschool children made the rest of the face consistent with the eyes. They didn't seem to care whether the figure was consistent with the position on the page. Later on in development, the children make the body consistent with the page. What the child puts down first, and where the child puts it, will determine where the rest will go, particularly if the child is three or four. The child will relate one part to another part, whereas when the child gets older, he will relate the parts to the page.

Participant

Children draw feet sideways, although the body may be coming at you. Egyptians did that because it showed the most accurate representation of what they were trying to depict. I think that children draw hands so that you see fingers no matter what the position of the hands.

Dr. Braine

I think Piaget's approach may explain what the child is in fact doing. He says, when the child draws a box, the child often draws all sides of the box spread out. The child is not drawing what is in front of him or her. The child is drawing the object as the child knows that object. When the child draws something, it is a different communication than when you or I draw it, or when the artist draws it. The artist is trying to represent something that is out there, and the child isn't trying to do it.

Participant

Could you give us some translation or applications as to how we could use these research findings in the classroom?

Dr. Braine

Well, one of the broad goals for teachers is to be aware of preferences of judgements made by young children. The way the child perceives can be taken into account when shapes are presented. Take a child who tended to make a /W/ and /M/. You can find out whether the child is making the /M/ shape because that's the way it looks upright to him. The /W/ really looks upside down. You could say, "I know it looks wrong to you."...Or you could ask the child, "Does it look upside down this way, or does it look right side up that way?"...Or, "Show me which way it looks right side up."... If you see that the child is reproducing it in the way the child says it is right side up, then you can talk to the child differently. You can say, "I know it looks upside down to you, but that's how we make a /W/. It's really an upside down /M/." One must have an awareness of the child's way of looking at shapes.

Participant

I think one of the most dramatic things that came out of your presentation is the necessity for watching the process, and not just the finished product. I have 30 children in my first grade class. How can I watch the individual process of each child?

Dr. Braine

I agree. The message is watch the process. The difficulty is not only does one have 30 children, but one doesn't know what to look at. I do think that there are some hints. One of them is to watch the order, for example, in which a child draws something, such as the lines and the direction. These things tell us something about the way the child organizes the pattern.

I wonder whether children with special problems actually follow the same rules as normal four and five year old children. Part of the problem is that they may not have these rules available to them, for whatever reason I don't know. Therefore, they don't know how to go about reproducing that structure. Maybe you have to provide some cue, like start here. Maybe they don't have a set of organizing tendencies. Maybe they don't have them in the translation from perception to reproduction. Some years ago, I tried to find out whether retarded children show the tendency perceptually to start at a focal point and go downwards. Since normal children of 3 and 4 years recognize geometric shapes which they call upright better than geometric shapes which they call upside-down, I wanted to find out whether the same thing were true for retarded children of comparable mental age.

What seemed to emerge was that there were two kinds of children in the retarded group. Even though they were roughly equivalent in terms of mental age and in terms of other criteria I had used, one group of children did very well on the task, and could recognize pictures at a hundreth of a second. The second group needed to have the pictures shown much more slowly, and it was that group of children who behaved like the normal children of comparable mental age. There is some developmental shift in the nature of directional processing, and I think it would be important to find out what happens in children who are not normal.

Participant

Is it essential to shift, say from left-to-right to right-to-left, to learn one or the other thoroughly?

Dr. Braine

I don't think so. I do think you should learn the right motions for the specific material you're dealing with. It's probably important when five and six year olds are learning to make letters, that you show the child the correct motion. When you really have the shape well organized, then I think probably you can make it in a variety of ways. One of the things that the Ilg-Ames data on drawing show is that the young child tends to follow more specific rules than the older child. Young children, when they draw a square, draw the two vertical lines first and then the top horizontal line, and the bottom horizontal line. One becomes more variable as one becomes older, and that is because we have the structure organized. I really would suspect that when the child is learning, the actual motions and directionality probably do matter.

If we have a left-handed teacher teaching kindergarten, it might be sensible to ask her to use her right hand when she's printing on the board. To accommodate both right and left-handed children, the teacher could say for children who use the right hand that the /E/ is made this way. For children who use the left hand, this is how you do it. The motion is indeed different. If you make the same motions, the same letters are going to end up with the reverse letter. We have plenty of evidence from other cultures that it's possible to learn a lot of specific orders for different materials (e.g., in Israel, words are written from right to left, numbers from left to right, and music from left to right).

Participant

What is the right way to teach writing letters?

Dr. Braine

I don't think there is one. I think there are general guidelines. By the way, when we were talking about direction, I want to make sure you understand. While there are preferences to go from left-to-right in the drawing of a line, there is no question that the top-to-bottom thing dominates the left-to-right. In reproducing the cross, virtually everybody draws the vertical first, regardless of age. There's evidence on the perceptual side for a tendency to go downwards (although there's an age change in the starting position). All languages, to my knowledge, go downward. The languages may start at the left or right, may go horizontally or vertically, but no language goes up. Everything always goes down. I think there's a very strong tendency in the way we process things to go this way.

I've often wondered whether, with children who have special problems in learning to read, it might be worth trying to teach such children first by having the word presented vertically instead of horizontally. The child would never do reversals. Then, once the child is able to handle certain units, it might be possible to shift to the horizontal presentation. If one has special problems, it might be worth a try. Once you've gotten children to organize correctly, then you could try shifting them gradually. I think whenever we can feed into what is their natural tendency, we then can get easier learning.

I want to move on to the question of the relation between the tactual and visual learning experience of shape. At one time there was the general notion that touch educates the eyes. The child got to know shapes by first tracing them. Now, all the evidence says that it isn't so. Everytime people have asked a child to discriminate shapes tactually and visually, visual discrimination has been superior to tactual discrimination. It might be claimed that they eye educates the hand. It is very difficult to get a three year old and even a four year old to distinguish a shape tactually. Even newborns can make visual discrimination of patterns but give no evidence for tactual discrimination (especially since the hands tend to be clenched and show a grasp reflex). I really felt like raising this issue because some years ago I remember seeing letters of sandpaper. The idea was, if the child is having difficulty learning the shapes, then give the child experience tactually. The tactual experience is supposed to transfer to the visual experience, but all evidence seems to speak against that point of view.

Participant

Has the evidence been obtained for children with visual perceptual difficulties?

Dr. Braine

No. The results were from normal children. However, if one says that touch aids vision, then at some point of development, tactual perception would have to be better than visual perception (or at least as good), in normals as well as handicapped. There is no stage anybody knows of where discrimination based on touch is equal to discrimination by vision (or shapes). Give children the task of discriminating geometric shape tactually, and they will have difficulty discriminating even three-dimensional shapes.

Participant

My understanding is that visual perception is not developed in the absence of tactual experience.

Dr. Braine

The evidence from infants does not support that view.

Participant

There are programs that deal with tactual learning experience, like many parts of the Montessori program. They are actually wasting their time by schooling all these normal children in this way.

Dr. Braine

I'm sure the children are doing shape discrimination visually. On the other hand, we all know that children of three find it gratifying to do things tactually. They love playdough. It's just a medium that is appealing at that age.

Participant

What about the concepts like feel, or fuzzy. How would you get that across?

Dr. Braine

That is a tactual concept. I'm speaking of visual shapes. I don't think that tactual helps you with visual discrimination.

Participant

In visual discrimination the child can see the total. What kind of a limit can a child reach by touching or by tracing with his hands?

Dr. Braine

It has been suggested that tactual discrimination is more difficult for a child because the child has to integrate a series of parts over a period of time. Visually, the child often can perceive the entirety at one point in time.

Participant

I have a feeling that we're going to have to talk about what we see. Is it what's out there, or do we see what is in our heads?

Dr. Braine

There is no question that people look and children look, but we don't see what is out there. That is the problem. When more than one modality is used, we really don't know where the benefit to the child is in that circumstance. Is the child doing better by adding up the inputs, combining them in some way? Or, is the child doing better because the child is more attentive? Goodnow did some experiments with normal preschoolers and young school children on this question. She gave the children some objects under several conditions.

One condition was looking. A second condition was looking and handling. She then asked the children to describe uses for the objects. In the look and handle situation, she wasn't sure whether they were putting information from the two modalities together, or whether they were more attentive. She constructed a special box, and the children looked at the item in this box without ever touching anything. They did just as well as the children in the look and handle condition. Her conclusion was that it had to do with the increased attentiveness that sometimes touching an object would bring to the child. I am sure that we have all noticed analogous processes ourselves. For example, when young children want to pay visual attention to something, they will point to it. Perhaps the finger does guide the eye sometimes, but in such a case, the hand is keeping the eye attentive in the right place rather than aiding the eye in discriminating the visual shape.

Participant

Finger spelling into a hand of a blind person must be done motorically. The memory of the motion is in that hand. There is no vision and there is no hearing. There is no visual memory because there never has been any. There never was any auditory input. It's a tactual memory.

Dr. Braine

When I was saying there was no motor memory, I was excluding very obvious things like how you ride a bicycle, or how you walk. I don't think I'd want to say that there is a motor memory of a square unless you mediate it non-visually. If you mediate it tactually, then there would be a tactual memory. Ordinarily, when we talk about having both the visual and verbal memory, we are referring to a picture that we code both visually and auditorily, or verbally.

Participant

There are areas of the brain where vision is affected, and also hearing is affected. If one is going to be impaired, then there is likelihood you are going to find impairment in another area.

Dr. Braine

There is deafness that is due to brain damage, and there is deafness due to damage that occurs in the peripheral area. I think it is one thing to say it is going to take longer for a handicapped person to get to the point as a nonhandicapped person, and another thing to say they will never get there. I'm asking the question of whether it will take the handicapped person with peripheral damage more time, or is it that the handicapped person will not get there at all?

Participant

In my classes during the past ten years, I have had five students, deaf graduate students, who were given the same amount of work. They showed the same kind of ability as the normals.

Participant

In general, statistics show that the deaf do not read as well as normals, even when the groups are matched on a number of relevant skills, like writing and spelling. But the deaf child of deaf parents does not show this deficit because he learns language in the same way that the parents learned language, from birth, but visually.

Dr. Braine

This is a different, and very important point. Earlier the claim was being made that the absence of a sensory modality inevitably made for cognitive difficulties. Now the point being made is that if the child does not acquire language at a critical period, the child will always suffer from some cognitive defects. That is, the important thing is not the modality loss, but the absence of early symbolic communication.

Participant

There should be an awareness by the adult of the rules: the rules used by normal children, and the rules used by handicapped children. At that point we get into the different age groups. Another point is to watch the process rather than checking on the end result.

Dr. Braine

I think we should say, here, that we are talking about the reproduction of shapes specifically, and not just about anything. Let's ask where the child starts, the direction in which he moves, and the order in which the different portions are drawn. Where the child starts should be first; order comes second. The starting position for visual processing is the focal feature for preschool children, and then shifts to the top for older children and adults. In fact, at all ages, as far as we can tell, processing of visual shapes or arrays goes in a downwards direction. The reason for this is not known, but one obvious possibility is that the important things in a child's world are always above, and so the child's attention is focused there, and then the only direction to move is downwards. Let me stress again that the use of the word "movement" is figurative -- I am referring to a direction of internal processing, not actual eye movements.

Participant

I want to ask you about a normal child in terms of teaching visual discrimination. In terms of teaching strategy, what would you see as a hierarchy of teaching form discrimination?

Dr. Braine

By and large you don't have to teach form discrimination, given that the child has what we call normal seeing environment. It is true that the minimal condition might be that the child has contours in his environment. We're not talking about the child being raised like some experimental monkeys with ping-pong balls over their eyes.

Participant

A normal visual environment.

Dr. Braine

As a matter of fact, for the normal child who is raised in an usual visual environment, you don't have to do any formal teaching about form discrimination.

Participant

To get back to special children. It seems to me that we have to define what population of handicapped children we're talking about, and what the deficit is.

Dr. Braine

Surely everybody agrees that there is no such thing as one type of handicapped child. There are many types of handicapped. Maybe we could try to describe some major types that seem to be perception based, and see whether we can bring anything we've dealt with to bear on the issue. For example, how one helps a perceptually handicapped child, in whatever areas the child is handicapped, to make advances.

Participant

I think some of the points that were brought out in normal children are relevant to the handicapped child on a greater scale, e.g., knowing his frame of reference and what it means to him.

Participant

Let me give an example. We have a learning disabled child about 12 years old who apparently has some visual problem, and therefore cannot read.

Dr. Braine

What are the visual perceptual problems? What's the evidence that the problem is perceptual? What can or cannot the child do?

Participant

Well, we were talking about the tactile method. We could use a different form instead of depending on the visual modality. What I'm trying to say is when we find a weakness, then find the child's strong point and work from there to introduce things he isn't getting.

Dr. Braine

I think it is very relevant when one is talking about children who have a deficit in one modality to bring in an alternate modality. The issue is, what is the best alternate modality to use? And at what age? I don't think there is a simple answer to the question. One modality might be a good one to use at one age, and another one at another age.

Participant

You couldn't use the same modality possibly with two children who are at the same age. One may not respond this way, and another does.

Dr. Braine

As long as we describe individual differences, we can't do anything anyways. If people did tailor their stimuli to the modality the child is most responsive to, then we wouldn't have any problems. But I'm not sure that is what people do. I think the first step would be to try and find where a child is in terms of his visual development. Then, you could try to understand why the child is stuck, wherever he or she is stuck. We must first diagnose the difficulties in a particular modality and then you can move on from there.

Participant

The question seems to be how can we pick these children out before they reach the age of 10 or 12? Somehow, some of them pass the usual screening process.

Dr. Braine

The deficit just may not be there at an early age, and may become manifest only when the function would normally develop, but does not appear. As many people have said, children grow into their symptoms, and that is not simply because we are poor diagnosticians, but because of the nature of the growth process. Growth does not consist of more motor skill, or more mental age (although our tendency to use number on test scores implies this), but in qualitative changes in the organization of the skills, be they mental or motor. From this point of view, some deficits are not diagnosable at an early age because that level of developmental organization does not yet exist in the child. In any case, we should only diagnose children conservatively. I don't think you do a lot of good by diagnosing a child as deviant when the child may be a bit slower than somebody may like. There is a lot of individual variation and we should give children the option of going a little faster or a little slower without labeling.

Participant

Would you agree that there are certain critical functions that do appear at certain ages that all teacher should know about?

Dr. Braine

There certainly are statistical norms for perceptual functions, and this information probably would be useful.

Now, I want to talk a bit about laterality. There is a great deal of new work being done on lateralization. People used to say that the left hemisphere of the brain is specialized for language and for motor functions. Therefore, the left part of the brain is often called the dominant hemisphere. I think ideas have changed in two ways. One is that many more functions seem to be lateralized, not just motor and language function. People now talk about the right hemisphere, not as being nondominant, but as being specialized for something else and dominant in its own way.

There are two sources of data relating to this lateralization. One source is the literature on pathology; that is, people who have brain injuries. These are mostly adults. The critical literature comes from accident wounds, or injuries of that sort, where you have a fairly lateralized injury in a normal brain. The other source comes from studies on normal people. This is more recent, since you have to have sophisticated tests for testing normal people.

The clearest literature on the functions of the right hemisphere comes from pathology of adults with injuries to the right hemisphere. A lot of funny things happen to these people. They have difficulty in handling perceptual-spatial tasks, and these difficulties are not limited just to visual tasks. You can test out a spatial task tactually and find that people with right hemisphere lesions have difficulty, whereas people with left hemisphere lesions perform close to the norm. The right hemisphere now has been called the spatial hemisphere.

In working with normal people, it is also possible to find evidence of lateralization of perceptual and cognitive functions. Some years ago, I worked with brain-injured adults and normal adult controls on a variety of tactual tasks. One of our surprising findings was that adults are much more sensitive to light touch, or pressure, on their left hand (at least in right-handed people). When we did additional work, we found that most of the left side of the body was more sensitive to touch. This greater sensitivity of the left side does not appear for all tactual tasks -- for example, two-point discrimination is not better on the left. We do not know the functional significance of the greater sensitivity to touch of the left side of the body and the right hemisphere of the brain, but the data add to the growing body of knowledge of lateralization of perceptual functions.

Let me describe another task used with normal adults, and then we can look at the situation with children. Everybody knows that verbal functions are lateralized, and that for most right-handed people, the speech hemisphere is the left side of the brain. One technique for studying speech lateralization is the Dichotic Listening Test. Pairs of digits are presented simultaneously to the two ears, e.g., 1, 6, 7, 3 into the right ear; 2, 3, 5, 6 into the left ear. When the items consist of numbers or words, normal people seem to hear them better from the right ear. (As you probably know, both ears are represented in both hemispherees, but the right ear has a larger representation in the left hemisphere, and vice versa.) Conversely, nonverbal stimuli are heard better by the left ear. The stimuli used are environmental sounds. For example, in one ear, you put in the beep of a car, in the other ear, the sound of a drill; or in one ear, you put in coughing, in the other, somebody sneezing. These paired sounds are heard better by the left ear. This doesn't mean you don't hear what comes in the other ear; you do, but you hear significantly better in one ear than the other. Which ear hears better depends on whether the material presented is verbal or nonverbal.

For most of the major modalities, say vision, audition and touch, there does seem to be evidence of lateralization for perceptual functions. I think that's a somewhat new idea. We now think of the two hemispheres, not as a dominant or a nondominant one, but as each being specialized to be a primary processor of different kinds of materials.

There isn't as much material developmentally as there is for adults. Doreen Kimura and students of hers have done most of the work with children. It looks as though the auditory tasks show the same kind of specialization even in four year old children as we find in adults. The speech tasks are lateralized in the left hemisphere and heard better by the right ear. Perceptual ones, such as melodies and environmental sounds, are better recognized through the right hemisphere, or the left ear.

In some of the data, there was a suggestion that girls may be ahead on some of the lateralization, but it's not a very pure picture in the auditory task. Whenever there seems to be a sex difference, it does seem to be in favor of the girls showing the lateralization a little earlier. But I want to make it very clear that it's still a tenuous thing. In general, both sexes showed some evidence of lateralization for auditory tasks even at four. Visual tasks for lateralization have not yet been devised for children of that age.

Kumura and I have data that there certainly is lateralization of motor functions in normal children, even by age three. I suspect it's even younger. If you take a three year old, you can get differences in hand strength, and difference in tapping speed with the two hands.

Earlier I mentioned that in adults the left part of the body is more sensitive to touch. Girls by age six show the adult pattern; that is, they are more sensitive on the left hand than they are on the right. (There's a funny shift just around the time of puberty in which the sensitivity of the two hands seems to come together in the girls, and then goes back to the adult pattern.) We can say, then, that the lateralization of touch function appears very early in girls. The lateralization for touch comes in around 10 years of age in boys. In comparing lateralization for different tasks, it is clear that lateralization is not a single process, but occurs at different ages for different functions.

One of the reasons I wanted to talk about laterality is that I thought it is just conceivable that some of these tasks might be useful diagnostic tools. There are data indicating that lateralization shown by the Dichotic Listening Task, putting sounds into two ears simultaneously, is a better indicator of speech lateralization than handedness. I think the auditory one would be the first one to look at because that is lateralized early in normal children.

Participant

But how do we know that in brain-damaged children you have this same laterality?

Dr. Braine

There is evidence with brain-damaged adults that the Dichotic Listening Test is better than handedness in evaluating speech localization. At the Montreal Neurological Institute, people with focal lesions were going to be operated on. Some of the patients didn't show clear laterality signs for speech. They used the Wada Test on them (some people call it the Sodium Amytal Test), which essentially inhibits functioning in one hemisphere briefly. In this way, one can tell in which hemisphere speech is located. The Dichotic Listening Test was given to these same patients. While the Dichotic Listening Test didn't correlate 100 percent with the Wada Test, it apparently gave much better predictability than handedness.

In pathology, the Dichotic Listening Test is used as a diagnostic tool to determine the side which speech is lateralized on. It's true that these adult patients are probably different than the children. But that's what you've got to work on. It may be that the Dichotic Listening Test will help you in making a decision as to which hand to use.

Participant

Now that is where research could help us.

Dr. Braine

I do hope that some day we will be able to work out the development of the lateralization of visuo-spatial functions. It's my feeling that in normal children, this lateralization develops much later than for the auditory tasks. It may be that there are problems in that kind of specialization in the hemispheres with some of the children with learning disabilities.

As you can see, the questions and problems being raised are difficult ones to answer. Although we may be taking faltering steps now, I have confidence we will get at this thing in time to come. It has been a pleasure to have had this exchange of ideas with you.

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CLOSING REMARKS

Dr. Shirley Cohen

The purpose of this session is to talk about what took place -- what we learned, what we didn't learn, what good things happened, what we didn't accomplish.

We set some rather difficult tasks for ourselves. First, to get research psychologists and educational practitioners to come together, to share and to exchange ideas. This doesn't happen very often. More frequently, practitioners meet with practitioners, researchers with researchers; or, researchers lecture to practitioners on their findings and then disappear, leaving the educators to figure out the implications of these findings themselves.

Our second task was to work out some implications from the research presented to the education of young, handicapped children. Did we accomplish these goals? To what extent?

Dr. Pat Lee

Let me talk in terms of the three roles of the translator: The anthropological role, mediational role and developmental role.

Anthropologically, I think we spent a great deal of time trying to find out about each other. I think the special educators played it a little bit too close to the vest. It wasn't until the 11th hour that I began to make some genuine anthropological observations about that tribe which started to perform and tell me things about itself. Prior to that, the researchers were the ones that were being observed and trying to show what they could do for the conference, hopefully with some success. I think the reason for this is that the researchers were being watched, and weren't given anything to watch. Perhaps, what we need now is another kind of conference in which we invite 55 researchers and a smaller group of special educators to become the seminar leaders. The researchers would become the observers and hopefully get a better understanding of special educators.

My feeling is that no one took primary responsibility for the mediational role. It was the responsibility of the personalities involved. I think that toward the end of our particular seminiar (social-emotional development), there was a lot of mediating going on. The participants were well-adjusted people who had definite feelings towards one another, and negotiated differences.

The developmental role is really the long-term working role of the translator. This is not the kind of thing one can do in a couple of days, much less in a couple of meetings. It can be rudimentary at best. In one seminar, we handled a few ideas on teacher training, its scope, and some vital components that it should have which are presently lacking.

Dr. Lila Braine

We had a rather free, good interchange. We started off with a presentation and the rest of the time was not highly structured. We discussed how some of the presented material related to special education. We had a give and take and I think it worked well in our group.

Dr. Robert McCall

I was allowed to float from seminar to seminar and I appreciated that. I happened to learn a great deal in the groups I went to. In the course of the discussions, I found myself hearing similar themes from one group to another. The groups as I saw them varied terrifically on a number of dimensions. They varied on the degree of theory involved. They varied on the applications dealt with. They varied on the time in which they did this, the tone, the degree to which there was a groupy atmosphere. The competence on both sides, the resource people and the participants, was very high. The four leaders were enthusiastic, committed, involved and knowledgeable people. I was also impressed with the participants. I came away with a much greater awareness of the problems of education.

I had an observation of one problem in the translation. We came as researchers with a data base from which we began to make statements. There was some commonality for us in that data base. We may not agree on the interpretation of those data, but at least we start some place. There is less of a common experiential data base between researchers and applied people.

Although I think that almost everyone can say he came away with some new knowledge, new insights, redirection, or what-have-you, many will feel some degree of frustration in that they didn't come away with a whole new ballgame. Some place along the line, we need to appreciate that there is a gap between what we know, on the one hand, and what we're asked to perform, on the other. Language is a good example.

The amount of hard data on how language develops is limited, and yet the teacher is asked to correct it, to remediate it. I would come away from this conference with stimulation to try to get researchers interested in more applied problems.

Dr. Harry Beilin

I felt that my job at this conference was to bring the kinds of points of view that are being developed among linguists and psycholinguists to a group of practitioners who were working with language. In one sense, it was very easy to do because there is a body of research that exits out there. My job was to try to act as translator and pull away as much technical language as possible and try to communicate the message in the simplest, natural, common language that we share. It was difficult, however, to express some of the concepts of some of these ideas in a natural language. It was almost impossible. I came with my own baggage of language from my discipline and it ended up that I had more than a communicational task. I also ended up, in some sense, with an instructional task. It was a constant instruct and re-instruct with regard to the fundamental ideas I was trying to represent. The reason for this is that the field we're working in is extraordinarily difficult. A number of people in our group experienced an enormous shock. They came with their expectations, thinking that they knew a reasonable amount of psycholinguistic and linguistic theories, never expecting to get what they got. I really laid it on heavy. It was pretty thick going at the beginning. I knew that I really wasn't getting the message across, because nobody understood the language even in which I was expressing it. So I ended up instructing, but I really didn't mind. Being challenged at practically every turn, not only in regard to the things I was saying but even the concepts I was expressing, I ended up by clarifying and adding to the ideas I was dealing with. It forced me to formulate ideas and concepts to satisfy my audience, and in turn I satisifed myself very nicely as well. I leave here, having instructed myself and been instructed by the people I exchanged ideas with.

We undoubtedly fell down over the extremely difficult task of trying to translate these rather profound, sophisticated, esoteric ideas into practice. There is a great gap between the generalizations that we expressed and the children we have to deal with in generalized curriculum objectives in terms of the methods that we utilized. It isn't easy to bridge this gap in the short period of time we had. The frustration I experienced personally was in trying really to satisfy everybody. My own feeling is, however, that I tried to do something and I thought I did it reasonably well in my terms. I have no idea what the consequences will be for any of the people who were there. I've enjoyed playing the game. I had the feeling of fun in doing what I like to do: talking about the things that I like to talk about. In that sense, the conference was a great success because people talked back to me in the way I like people to talk back to me.

Dr. Robert Liebert

It is my perception that in the social-emotional area, the major developments over the course of the past ten years in terms of research have been to suggest that many of the principles of development are simpler than they were thought to be 25 years ago. The rather complex psychoanalytic theory has lost ground to relatively simpler ideas on the effects of the reward, punishment, and observing others. I think our group was more technique oriented. As a result, we were discussing immediately things that we weren't supposed to do until the second or third day. In the end, however, we were nodding and agreeing that we had told each other something. There were some ideas that we could really go out and use. There may be a possibility of pursuing future contacts that would be mutually useful.

Dr. Cohen

One of the factors which I experienced at this conference is the status difference between psychologists and educators; between researchers and practitioners. This differential status causes us to ask inappropriate things of each other. Educational practitioners turn to research psychologists for answers about practice, and research psychologists sometimes feel pressed to provide them. We have to learn to work together in ways we're not used to, if our interactions are to become more fruitful in terms of products for education. We, educators, have to learn to use developmental psychologists as resources to stimulate, guide and react to our thinking about implications and applications. We have to put more of ourselves into this process and take more responsibility for end products.

Another factor which somewhat limited our effectiveness in producing products was a lack of skill in group problem solving. We were educated to work on problems individually. This we know how to do and are most comfortable with. The usual type of group work we do is to give out assignments, work on them separately, then come together to share answers. We aren't used to trying to solve problems together all the way through.

Dr. Liebert

I think the wide range of professional skills of the special educators created some problems. You have some participants who are supervising classroom personnel, some who are dealing directly with handicapped children, others who are training teachers. You have people working at the tactical, strategic level and people at the policy level.

Dr. Cohen

This conference was specifically designed for people whose role is to train teachers or develop programs. There are a few people present who work directly with children. The majority of the participants, however, are program planners, developers, supervisors, administrators and teacher trainers. That was the intended audience. We tried to make it very clear in advance that this was not going to be a conference that would have immediate, practical applications in a day-to-day classroom sense.

Participant

In terms of the goal of the conference, the attempt to construct a bridge between research and practice is admirable. Researchers can influence and can make decisions, and do have something to say about policy and direction.

Participant

If this conference was intended for the administrator and not for the classroom teacher, I think the topics should have been different. We should have had sessions on mainstreaming: year or no; special classes: yes or no. Those are administrative types of questions.

Dr. Cohen

That would make a very interesting conference, but it was not this conference, nor is it the only important kind of conference. The whole point of this conference is that one of the foundations for educational planning should be knowledge of the latest thinking about children's development, and skill in drawing implications from this knowledge. Without this knowledge and this skill, educators are likely to make poor decisions in new situations.

Dean Gold

To me, this has been an extremely gratifying conference. I learned a lot. I come away with a great feeling of euphoria. I had nothing to do with planning this conference, so I feel free to say it has been spectacular.

EVALUATION

Participants were asked to complete evaluation forms at the end of the Special Study Institute and again one month later. Summary data is presented below.

EVALUATION I* (At termination of the Institute)

1. Please check the terms which best describe this Institute:

32 interesting	____ dull	26 well done
1 unfruitful	21 productive	3 poorly organized

	Yes	No	?
2. The objectives of the Institute were clear.	29	6	1
3. The content presented was appropriate.	30	1	5
4. The manner of presentation was appropriate.	29	2	5
5. The speakers and seminar leaders were effective.	30	2	5
6. I am more knowledgeable about the process of utilizing research findings in the educational process.	31	2	5
7. I am more knowledgeable about recent research findings re how young children develop and learn.	21	8	9
8. I plan to follow up on interest aroused during the Special Study Institute by further readings or discussions re research findings.	30	5	2

9. This Institute was:

21 a very valuable experience   17 somewhat valuable
1 not a valuable experience

*Based on responses from 38 participants

EVALUATION II** (One month later)

1. If another conference on this topic is held next year would you like to be invited?

25 Yes   2 No   4 Maybe

2. Have you (or do you plan to) utilize any of the information obtained at the conference in your work?

25 Yes   2 No   4 Maybe

3. *At this time*, what is your feeling about this conference?

Very Valuable 14   Valuable 10   Of Some Value 5   Not Valuable 3

**Based on responses from 32 participants.

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